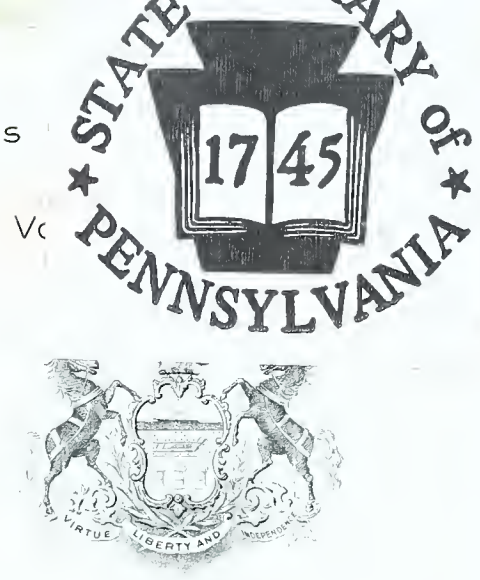
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The Inventive age

A JOURNAL OF MANUFACTURING INDUSTRY

The Inventive Age

AND SCIENTIFIC PROGRESS.

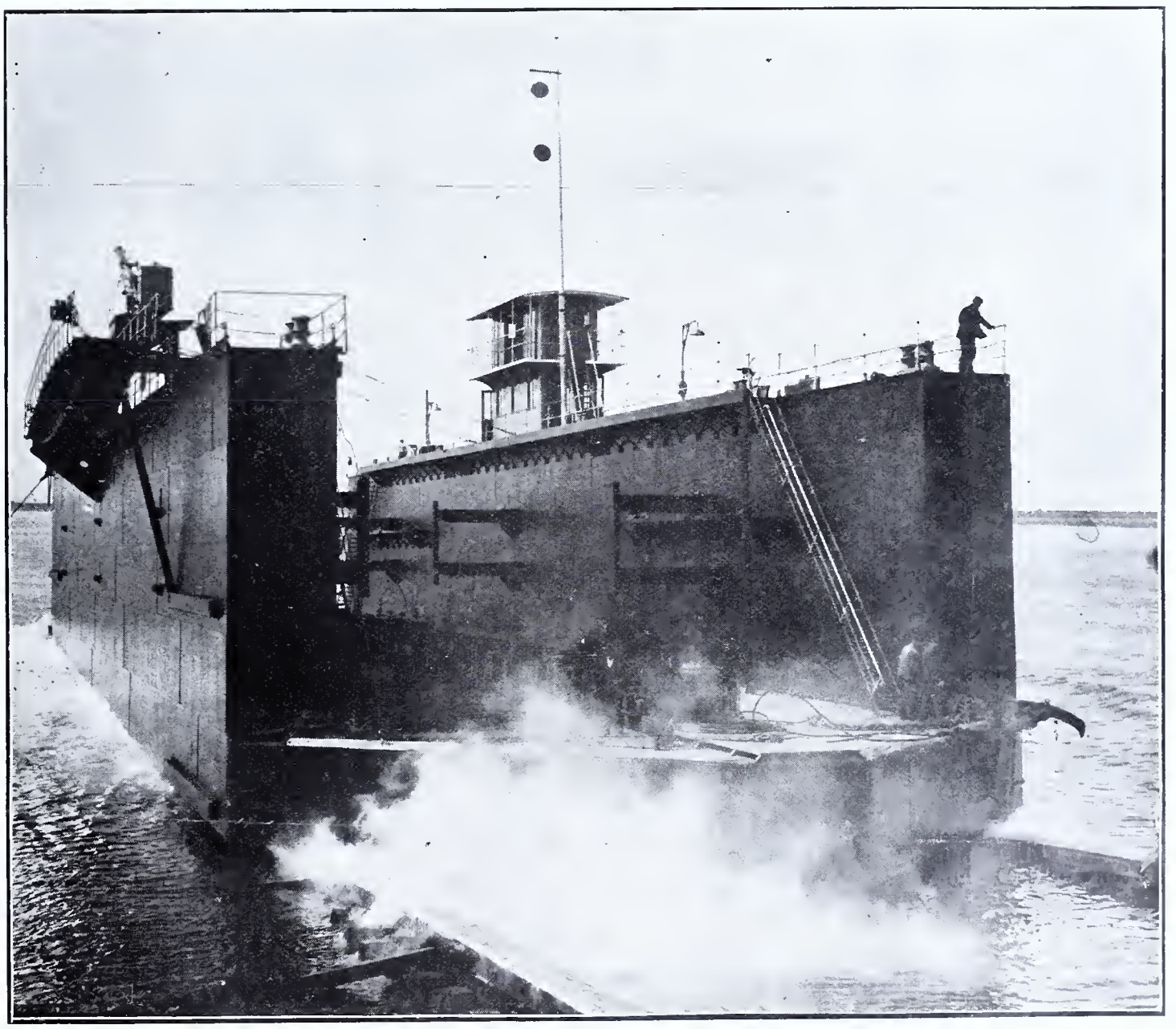
TWENTIETH YEAR. No. 1. | WASHINGTON, D. C.---JANUARY, 1908. | SINGLE COPIES 10 CENTS. ONE DOLLAR A YEAR.

A NEW ELECTRICALLY OPERATED DOCK FOR SUBMARINES.

By FRANK C. PERKINS.

THERE was recently launched in England a new electrically operated floating dock for submarines at the Naval Construction Works at Barrow-in-Furness. This electric floating dock is 250 feet in length over all, and was constructed for the British Admiralty for use at Hasler.

It is provided with a complete system of pumping gear for expelling the water from the chambers in the floating dock, which system works entirely by electric motors. The dock is lighted throughout by electricity, both arc and incandescent lamps being provided so that work may be carried on at night equally as well as during the day. It is fitted up with all the usual electrical appliances, and a three ton crane is mounted on a travelling under-carriage placed on the starboard wall, while an electric capstan is mounted on each wall of the dock, greatly facilitating the handling of the dock as well as the submarines which are to undergo repairs.



This new floating dock is 50 feet 6 in. wide, and has a depth of pontoon at the center of 6 feet 4 inches. It was built by Messrs. Vickers Sons & Maxim, Ltd. of London, at the works at Barrow-in-Furness, and in addition to the usual keel block, there are three double mechanical side shores provided in each wall.

The length of the side walls is 200 feet, and the hull is constructed throughout of open hearth mild Siemens-Martin steel. The height of the side wall above the lower edge of the pontoon is 25 feet 6 inches, and in the center of the starboard wall a two-story motor house was constructed with galleries provided to contain the electrical equipment and controlling apparatus. The height of the side walls and pontoon is 28 feet, and the dock is required to lift a vessel having a maximum draught of 10 feet, and displacing 1,000,000 pounds within a space of 60 minutes. The two-storied motor house above mentioned in the starboard wall has, on the ground floor, the various electric motors, together with their starting resistances; while on the second floor immediately above are located the switchboard with electric measuring instruments and electric controlling circuit breakers and switches, as well as the different valve levers by which the operator controls the various mechanical devices, including the pump for exhausting the tanks, and the opening of the pipes for filling the same, as the floating dock sinks to the proper level for taking in the submarine.

It is stated that this new English floating dock for submarines has a net lifting power and is capable of docking a vessel having a draught of 16 feet.

The shipyards of Vickers Sons & Maxim, Limited, in Barrow-in-Furness, as well as their River Don Works at Sheffield, England, are equipped with labor-saving devices such as electrically operated cranes, and machine tools of the latest type, while complete electric power plants have been installed with electric lighting outfits so arranged that the work may he carried on day and night without interruption.

THE FLAG POLE SURMOUNTING THE TALLEST OFFICE BUILDING IN THE WORLD.

By JOHN P. SLACK.

The 45-story Singer Building, New York, represents the supreme test of the builder's art so far as skeleton construction is concerned. Before the lofty tower was reared to its present eminence, the trials and problems of the builder were many. Now that the work of enclosing the gigantic cage within its shell of stone and brick is well under way, all difficulties in the building of the skeleton frame seem to have been safely surmounted. The crowning feature of the achievement, viz., the placing of the 90 foot steel flag-pole which surmounts the dome, gave not a little trouble to the contractors before its base was safely in position at the 43rd story.

Composed of hollow steel tubing, the pole is imbedded for 30 feet of its length in a specially constructed steel pocket extending from the 43rd floor to the top of the tower. The portion extending beyond the tower is 60 feet, or two-thirds of its total length.

At the 43rd story is a ten foot length of steel tubing, its dimensions 9¾ inches inside, by 10¾ inches outside. This is fitted at the wrought bottom into a rod steel shoe 18 inches square. This portion of the pole projects through the 44th floor, and is screw-joined into a 20 foot length of smaller piping, thus bringing the socket of the pole three inches outside of the outlet ring which forms the highest part of the dome or lantern surmounting the main structure. At this point, the slip-joint occurs, telescoping 9-⅝ inches outside by 8¾ inches inside, into the 10 inch socket, for a distance of 2 feet 6 inches. From there above, the pole is in five sections, 60 feet over all, and tapers from the 9¾ inch before mentioned to an ultimate 5⅝ inch. The four joints are accomplished by shrinking the larger over the smaller size piping for a distance of about 20 inches. In addition, each joint is tapped and bolted. At the top, the pole is closed by means of a ball-bearing truck mounted on a cast iron reducing coupling into which the king-pin is screwed.

The body of the cast iron truck containing the 2 inches by 4¾ inches bronze sheaves revolves about the king-pin on two steel ball-bearings to provide against the flag wrapping itself about the mast. The body of the truck is surmounted by a ¾ inch galvanized iron rod, 3 feet long, to the top of which is attached a 12 inch copper ball. The total weight of the pole is approximately 3 tons or 6300 pounds.

A difficulty confronted the contractors in turning over to the owners a steel flag-pole, in position which they could guarantee as exempt from the effects of rust and corrosion. While ordinarily, it would be an easy matter to paint a steel pole before placing it in position, this could not be safely done in the instance of the Singer Building, since in hoisting the huge pole to its ultimate destination, severe scratching in transit would have been inevitable. Such damage would have warranted considerable doubt as to its being fully covered with protective material when finally in position.

Furthermore, the action of the elements at this height 612 feet—was an unknown factor as far as steel flag-poles were concerned. Therefore, it was not deemed advisable to rely upon ordinary methods of giving the pole a coat or two of metallic paint, trusting to chance for results. The paint on steel poles erected on a considerable lower height than that of the Singer Building has been known to blister, due to the action of the sun's rays; then freezing weather, depositing its layer of icy coating, has removed portions of the blistered paint, thus leaving the steel beneath exposed to the action of the elements, with resultant deterioration.

At such an unobstructive height, wind pressure is a grave factor. With corrosion at or near the base of the column, a high wind might result in the huge steel pole being precipitated hundreds of feet, crashing through buildings or being hurled into the street below. Public safety is a weighty factor in any decision regarding the constructive details of a building of such huge proportions. In the instance of the pole above the Singer Building, it was not deemed advisable to take chances.

These provisions were necessary to obtain safety: first, that the pole be covered with a protective coating after being placed in position; second, that the effectiveness of the material chosen as a resistant to atmospheric conditions of all sorts be absolutely dependable. The first requirement was not easily met since the ordinary steeple-jack was found to be disinclined to accept a commission involving such danger as painting a flag-pole 60 feet high, 612 feet above the ground. Ultimately, E. Capelle of New York, a steeple climber of much experience, was found willing to undertake the work. For a material which would meet the requirements mentioned above, Voltax, an anti-corrosive compound made by the Electric Cable Co., of New York, was chosen. Since it is impossible for corrosion to exist on a steel surface coated with this preparation, it remained only for Mr. Capelle to apply it to the surface of the Singer Building pole.

Owing to the difficulty, in this instance, of manipulating the compound in its ordinary consistency, because of the insecure position of the workman, it was deemed advisable to dilute it from its thickened state and to apply five coatings in its diluted form to insure proper protection.

In performing the feat of applying the compound, Mr. Capelle has a most interesting experience, and his statement of the conditions which obtained are of more than passing value. He states that the wind velocity at such a height ranges from 10 to 40 miles an hour at times when lower air currents show no appreciable velocity. With a stiff breeze blowing below, 40 to 80 miles an hour may be registered above. In the latter case, the top of the steel pole sways in a radius of about one foot. This movement, contrary to general impression, is an indication of strength. If the tensile strength of either a steeple or a flag-pole does not admit of a certain flexibility, high wind pressure is a dangerous factor. Instances are on record where both steeples and poles have been broken off by reason of lack of elasticity with which to accommodate them to varying wind pressure.

THE ROMANCE OF IRON AND STEEL.

(Condensed from articles by Herbert Casson in Munsey's Magazine.)

What iron ore is, nobody knows. It is part of the universal mystery. "A grand piano is a very simple mechanism compared with an atom of iron," said a famous scientist. It is found in almost all parts of the earth, and has even been discovered, by means of the spectroscope, in the stars. The meteorites that fly through space are usually found to be boulders of iron ore. They may be the cinders of exploded planets.

Pure iron is as white as silver. Expose it to air or water, and it tans with rust, as the oxygen burns it up. There is iron in plants, in animals, in human beings. In every hundred people, on an average, there is a pound of iron. For some reason still unknown to science, iron is as much of a necessity to man's brain and body as steel is to his civilization.

The greatest of the world's iron deposits is in the wilds surrounding Lake Superior. The value of the ore in that region, so far as known, is more than a thousand million dollars. As it lies in the ground, iron ore is cheaper than sawdust. One can buy twenty pounds for a cent. But in the Lake Superior tract there are mountains of it, prairies of it, lying red underneath the forest soil. And this billion dollar wilderness was discovered in the nick of time to give us the supremacy of the world in steel. The secret of our leadership lies not in the skill and the machinery, but in the fact that in the United States the ore is found, not in deep mines, but in vast pockets, in heaps, in ranges, on the surface of the earth, ready to be scooped up and carried away.

One body of ore is two and a half miles long, half a mile wide, and from one hundred to four hundred feet thick. The thickest mass is four hundred and forty feet through, emulating the Washington Monument and dwarfing the tallest of our sky-scrapers. There are five of these huge treasure pits, whose total product is eighteen million dollars' worth of ore each year. The largest of all is the Mesaba, in Minnesota.

At first, the Mesaba ore made trouble in the furnaces. Being so fine, it caked and exploded, or went up like smoke. But furnaces were soon built to prevent these mishaps, and today more than half of the steel made in Pittsburg, Youngstown, Wheeling and Joliet is made from Mesaba ore. Thirteen million tons—one-third of all the iron ore mined in the United States, and one-sixth of all mined in the world—comes down the Great Lakes every year. About 250 drills are now in operation in this district. This one item of drilling illustrates how elaborate and costly the mechanism of the iron and steel business has become. A common "churn" drill costs about $1500 and a diamond drill from $2500 to $4000.

Twenty-five years ago wooden schooners carried the ore across the lake. The first steel ore ships were disastrous failures, as two of them came apart in a storm. The whale back was introduced into the trade by Rockefeller, but today this type is out of date, as its hatches are too narrow for the unloading machinery.

The modern ore boat is made of steel, and carries on an average 7000 tons, at a speed of 12 miles an hour. Two years ago a Duluth company built the huge ore steamer Wolvin, carrying 12,500 tons having thirty-two hatches. For swift loading and unloading, this remarkable vessel has never been equaled. A load of 10,245 tons was placed on board of her in ninety minutes, and unloaded in four and a half hours. Forty years ago, it took a crowd of men three days to load 500 tons; the Wolvin takes the same quantity in five minutes.

The Wolvin has set a new standard for ore-ships, and last year, not to be outdone, the Steel Trust launched four boats of equal size, which will carry eight hundred thousand tons of ore down the lakes in a single season—enough to keep an old-time furnace busy for four hundred years.

The famous Suez Canal, the highway between Europe and the East, has only one-third the freight tonnage of the Sault Ste Marie canal, which connects Minnesota with Pennsylvania and New York. The majority of this traffic is the carrying of iron ore. At the loading end, there are seven harbors and six miles of docks; there is an ore fleet of 400 vessels, and at the unloading end, three ore harbors on Lake Michigan and nine on Lake Erie. Conneaut is the foremost on the Great Lakes in point of tonnage, and unrivaled in dock equipment. Four miles of cars can be loaded and hauled out in a day.

The unloading machines are the wonder of all visitors. You can see a fifty-ton car of coal picked up as if it were a box of candy and tipped sideways into a wide hopper, which conveys the coal to a vessel's hold. With the guidance of four men, 200 cars are emptied between sunrise and sundown. Here is the largest bridge crane ever erected, which can pick up or put down anything from a coal scuttle to a locomotive, at any spot within an era of seven and a half acres.

Here are the marvelous automatic unloaders, which are nothing less than gigantic steel arms that thrust themselves into a vessel's depths and grasp a ten-ton handful of ore apiece. Each arm has not only a hand, but a wrist as well. The operator, standing on the wrist like an obstinate insect, goes up and down with the powerful arm, which he guides in any direction desired. The towering machine weighs more than an army of 5000 men, yet it obeys the slightest touch of its master's hand as readily as if it were a bicycle. Six workmen and one machine can do the work that formerly required ninety shovelers. When the great hand of the machine is open, it covers 18 feet of ore, and closes with a grip that is irresistible. Sometimes, in the holds of ore vessels, steel girders are caught and wrenched away by the grasp of this mighty giant.

Machinery plays an important part, too, in the mining of the ore. It is scooped up by steam shovels, of the sort that are used to remove earth in excavations. At every swing of the shovel's powerful arm, five tons of ore drop into a big steel car. The arm swings twice a minute. In five minutes the car is heaped and another is pushed into its place. When twenty cars are full, the ponderous engine pulls them through the dense forest to Lake Superior. From the high trestle work of an ore dock the ore is dropped quickly into large bins, and the empty train returns to the mine for another thousand ton load. Since these deposits have been opened up, the problem of rapid mining has become largely a matter of railroading. As James J. Hill said, "The question of ore production has now become a question of the proper switching of trains."

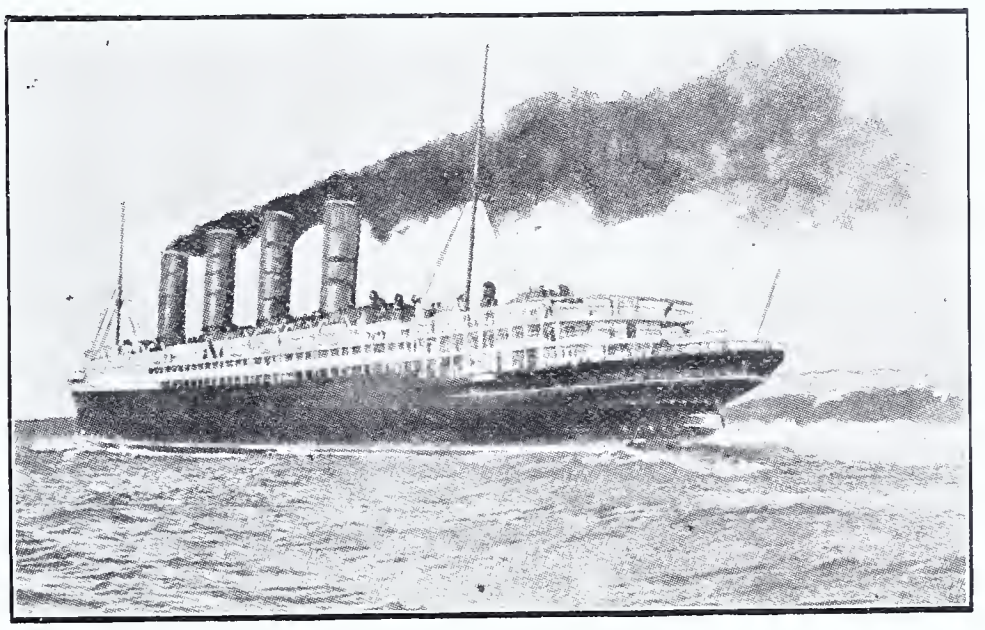
THE STEAM TURBINE.

The success of the steamer Lusitania, on her trial trips to and from America, must be regarded as marking a new era—the era of the turbine as a ship-propelling engine. Other vessels have been run in this manner for years; but when the system was decided upon for the huge Lusitania, the experience with this type of engine on such a scale was limited, particularly as regards durability. The success of the trials may not mean, as enthusiasts for this new form of locomotion claim, that the steam engine as at present known will soon become as effete as the high bicycle. The reciprocating engine, with double and triple expansion, ponderous cylinders and complexity of mechanism, cannot yet be regarded as an anachronism; but a serious blow has been dealt it by the simple, cheap and effective turbine.

It is over twenty years since the first practical steam turbine was made, and the credit belongs to an Englishman. The British government has given the new engine every encouragement, and through experiments in its navy, is really responsible for the creation of the big Cunarder. Mr. Parsons, the originator of the device, is still the leading mind in this branch of science. His first turbine, completed in the eighties, was a modest affair of 10 horsepower, but it rotated at the terrific speed of 18,000 revolutions a minute. By this primitive type, closely resembling the water turbine, 4,000 horsepower had been put to work up to 1888. In 1889, the radial-flow turbine was introduced; the application of the principle of steam-condensing marked another stage of the evolution. There are now various types of turbines in successful use all over the world, in industrial concerns.

Marine turbines were first tried in the British navy in 1897, and were commercially adopted by the Admiralty four years later. Torpedo boat destroyers and channel steamers were fitted with them, and attracted great attention from naval architects. Then two boats were launched for the Allan Line, to run to Canada, and a vessel was ordered for the New Zealand trade. But the most important step in the development of marine turbines was the decision of the Cunard Steamship Company to adopt turbines in the new vessels of that line. Considerable criticism followed, but the Carmania was launched, and was followed by the two express boats, one of which, the Lusitania, has just achieved a success which has established this type of engine as an assured feature in the ocean greyhounds of the future. As sails gave way to piston rods, so it may be safely assumed that pistons, cams, eccentrics and connecting rods will be gradually supplanted by the big cylindrically-enclosed revolving drum. The latter is the principle which makes the new engine so different from the reciprocating engine. This cylinder within a cylinder distinguishes the one engine from the other.

Imagine a stationary cylinder within which is a drum whose sides as well as the interior of the cylinder are covered with alternating rows of blades. On the drum of a big ship there are over 2,500,000 of them. The drum is attached to a shaft at the end of which is the propeller. The steam enters the cylinder at one end and escapes from the other. In passing it plays on the blades and revolves the drum with great rapidity, which turns the propeller. Such, in simple phraseology, is the turbine. There are no pistons, eccentrics, or connecting rods, which in reciprocating engines are necessary to convert direct motion into rotary; no packing rings or stuffing boxes to stop a leak of steam.



THE LUSITANIA.

When the steam escapes from the drum after passing through the rows or blades, it is forced into the condenser and from there goes back to the boiler in the form of feed water.

Engineers claim several advantages for the new turbine. There is the increased economy in steam consumption, which at first was contested, but was proven beyond doubt in experiments with two river boats on the Clyde. One of these boats showed its ability to get nine miles out of a ton of coal, against seven and a half miles for a boat fitted with the old type of engine. The turbine can also make increased speed, owing to a considerable reduction in weight of machinery. Then there is the complete absence of vibration from the main engines, which is most noticeable on the Lusitania. All ocean travelers will be able to appreciate the absence of this uncomfortable sensation. On a torpedo boat the vibration sometimes is almost unbearable; Kipling has graphically described what it is to try to sleep within its quivering steel walls. But on the new style of ship, there is none of this vibration. On the earlier turbine vessels fitted with multiple screws, it still existed, and was found to be very objectionable; but the recent designs, one screw to a shaft, have entirely done away with this evil.

Owing to the great velocity of the shaft which can be obtained with the turbines, smaller propellers can be used; also, since a great deal less space is required by turbines than reciprocating engines, it is possible to use more engines, more shafts and more propellers. In the Lusitania, there are four units of machinery and four screw propellers, this arrangement enabling the apparatus to be made in two completely separate sets, one to starboard and the other to port—just as in a vessel with twin screw reciprocating machinery; a distinct advance upon the triple-screw arrangement in former turbine ships, where such complete independence was unattainable.

Reduced cost of attendance and overhauling is another advantage. When the engines are once adjusted and closed up, the lack of reciprocating motion and the great reduction in the number of bearings lessens materially the attention necessary and the quantity of oil used. Both these reductions are gladly welcomed by the larger steamship lines, whose expense bills are rendered heavy each year by the cost of repairs and the purchase of oil. One English ship has not had the covers of its turbine lifted in two years, whereas on most of the big express steamships gangs of machinists are set to work on their engines at the completion of each voyage.

Improvements in turbines are steadily being made, and one of the most promising serves the purpose of keeping the steam always at normal pressure in the boiler, for both the forward and reverse movements, and also has the pressure for reversing always equal to that for forward traveling. The forward turbine consists of a high-pressure and a low-pressure turbine which act on a single shaft. By means of a three-way cock, steam may be admitted through the pipe and ports to either turbine. The reversing turbine is connected, as is the low-pressure turbine, by a pipe with a condenser, and is provided with means for regulating the partial flow of the steam by means of a number of valves which serve the separate nozzles of the guide channel in the ordinary way.

In view of all its advantages, the turbine is sure to have far-reaching consequences. The time is approaching when man can travel with as much comfort and speed at sea as on land. The distance between continents will be reduced. Quicker transportation of perishable products will bring to us many delicacies that are now unattainable, and carry our products in better condition to the world's markets. A new era of water transit is dawning. The achievements of the Lusitania give promise that the future will see greater progress in what has been called the most fascinating of all branches of applied mechanics—the rapid, comfortable and safe transportation of passengers across the seas, often turbulent and ever resistant, which separate the increasingly friendly nations of different continents.

Substitute for Chloroform.

The latest anæsthetic resembles cocaine, in that while it prevents pain, it does not produce unconsciousness. When injected into the spinal column it produces paralysis of the body below the point of injection and removes all sensation from the limbs, so that it has been found possible to amputate a man's leg while the patient retained consciousness, and might—had he been allowed—have even witnessed the operation. The patient felt nothing, and when sensation returned experienced only the sense of bruising, which always follows major operations. The new anæsthetic is of the greatest value in operations where the use of chloroform would be dangerous, owing to heart weakness or other causes.

Testing Cars.

An instrument has been devised for making complete tests of street cars while in operation. It consists of a table over which a roll of paper is fed slowly, above which are arms carrying small recording instruments. Each of these instruments is connected with a clockwork mechanism which causes it to register on the moving paper below every five seconds. Each instrument registers a special value—such as the amperes and volts used on each car motor, or the speed of the car, or its location on the line, etc., so that for every trip of the car over the road this device furnishes a graphical record of all the conditions of operation at intervals of five seconds. Such a record is far more accurate than could be made by any number of observers.

Glass Telegraph Poles.

A factory has been established in Germany for the manufacture of glass telegraph and telephone poles, which are to be used chiefly in tropical countries, where wooden poles are soon destroyed by the ravages of insects, and where climatic influences are ruinous to wood. The glass mass of which the poles are made is strengthened by interlacing and intertwining it with strong wire threads. It is proposed to use these poles, at first, in the German possessions in Africa.

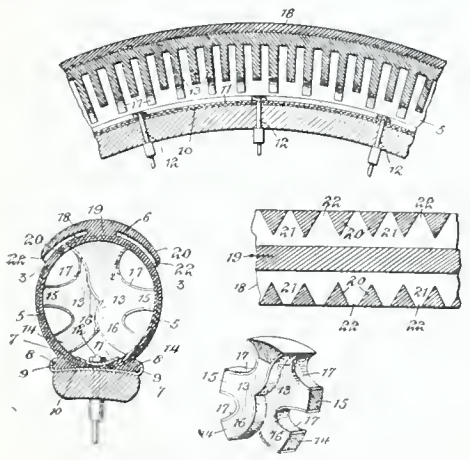
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CLEVER NEW PATENTS.

A New Automobile Tire.—Trap or Sink.—Power Transmission Gearing.

A New Automobile Tire.

It is of course well known that with the ordinary tire, pressure brought against the outer wall causes its movement toward the inner wall, separating and doubling the side walls, and permitting their ready collapse. The result particularly with the heavy grade of tires, such as those used on automobiles, is that they soon wear and break out. While many more or less successful attempts have been made to provide a tire that may have the necessary yielding movement without permitting the objectionable flattening or wearing effect, it is thought that Mr. William Thos. Wood, of Nashville, Tenn., a successful inventor in a number of lines, has finally solved the problem. He has produced



a tire having novel means for supporting the outer wall, such means allowing sufficient resiliency and yet effecting a gradual increase in resistance to the inward movement of the outer wall, the farther the wall moves. Another serious objection to the ordinary tire resides in the fact that when the tread surface becomes cut, the sand and dirt forced into the cuts will often collect and work laterally along the outer surface of the fabric, forming protuberances or "warts" that in time break out and often seriously injure the tire. The new tire is provided with means that will permit the free escape of matter that may collect in the cuts.

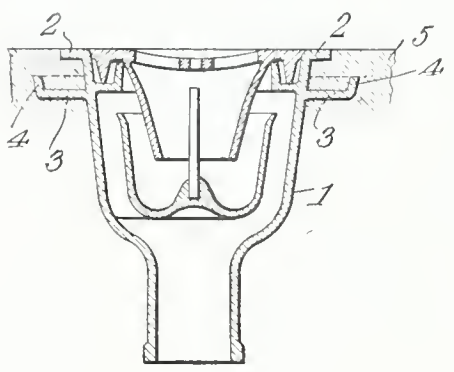
The tire, as shown, consists of side walls 5 with an outer wall 6 that may be reenforced with fabric. The inner wall is composed of sections 7 having outstanding ribs 8 arranged to interlock with the side flanges 9 of the wheel rim 10. This interlocking engagement is maintained by a transversely curved holding strip 11 held in place by bolts 12. Within the casing, a plurality of independent yielding supporting posts 13 are arranged, which are oppositely curved, the inner ends of the posts being alternately connected to the opposite sides and inner portions of the casing, as shown at 14. Each post furthermore has an intermediate offset web 15 jointed to one of the side walls. The free edges are covered with fabric 17.

With this construction when pressure occurs against the outer wall of the tire, the post at first will be compressed, but as this pressure becomes greater they will bend because of their bowed formation. At the same time, the bowing action will tend to force the web inwardly, and thus prevent the outward collapse of the side walls. The result is a tire that is very efficiently supported, and yet is yielding in order to absorb the shocks and jars incident to its use.

It will be observed by reference to the cross sectional view that a tread element 18 is located over the casing, being secured thereto by a central rib 19. On opposite sides of the rib 19 are triangular projections 20 shown more particularly in the horizontal sectional view. These projections space the edges or margins of the tread element from the casing and provide pockets having open mouths. With this construction, if the tread element is cut, the sand and dirt that is forced into the cut will pass into one of the passages and find a free passage through one of the outlets, thus preventing the formation of warts.

Trap or Sink.

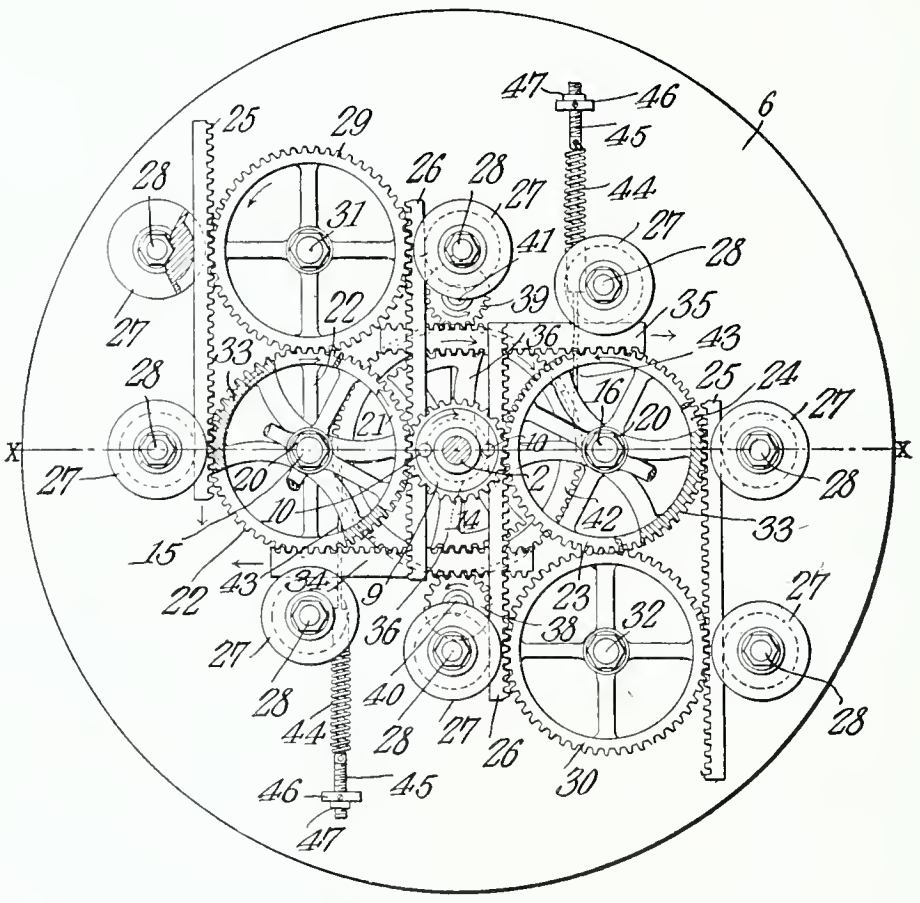
Mr. George Edwin Dunstan, of Lorain, Ohio, has recently patented a trap or sink provided with novel means for preventing moisture or water from creeping or leaking out over the usual top flange and passing down through the floor, thus disfiguring the ceiling beneath or doing other damage. The body 1 of the trap may be of any desired configuration, and has at its upper end an outstanding flange 2 located level with the surface of the floor 5. The interior construction of the trap can be of any character desired. The invention consists in the provision of an outstanding peripheral flange 3 located below the flange 2, and integral with the body 1.



This flange 3 is provided at its outer edge with an upstanding rim 4. It will be noted that the flange 3 is considerably wider than the flange 2 and is buried directly in the concrete, asphaltum or other material of which the floor 5 is constructed. This flange therefore acts as a stop so that water or moisture which passes over the periphery of the flange 2 into the floor will be caught in or dammed up by the basin-like flange 3. The utility of this arrangement will be obvious when it is considered that there is usually a slight crevice left between the trap and the floor, due to the shrinking of the cement in setting.

Power Transmission Gearing.

A somewhat intricate but certainly novel means for yieldingly connecting a driving and a driven member, constitutes the subject-matter of a patent granted to Mr. George Milner, of Brooklyn, N. Y., who has assigned his entire right therein to the Milner Power Multiplying Machine Company, of Brooklyn, N. Y. The object of this invention is to obtain an increase in power between a driving member and a driven member, and to permit the initial movement of the driving member without the necessity of instantaneously overcoming the resistance due to the inertia of the driven member. A face view of the mechanism is illustrated. The driven member is shown in the form of a shaft 2, and is located in direct line with the driving member or



shaft, which may be the engine or motor shaft itself. A gear wheel 9, loosely journaled on the driven shaft 2, is clutched to the driving shaft, and is in mesh with a pair of gear wheels 22 and 23, journaled on the face of a disk 6 that is fast to the driving shaft 2. These gear wheels 23 and 23 are connected by racks 25 with other gears. The system of gears and racks shown, connects said gears 22 and 23 with what may be termed a master wheel 42. The master wheel 42 is connected on diametrically opposite sides by means of flexible straps 43 to 44, the outer ends of which are adjustably connected by screws 45 to the disk 6.

With this mechanism, if power is applied to the driving shaft to rotate the same, the pinion 9 will rotate with it. Motion from this pinion is transmitted to the gear wheels 21 and 23, and from these gear wheels through the system of gears and racks down to the large gear wheel 42. The gear wheel 42 being rotated, will wind up the straps 43, thus extending the springs 44; and the stress under which these springs are put, will gradually start the disk 6 to rotating. This disk is secured to the driven shaft or member 2, and will therefore gradually bring said shaft into operation until it finally reaches the speed of the driving shaft.

PATENTS

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

BROWN et al. v. LANYON et al.

(Circuit Court of Appeals, Eighth Circuit. November 9, 1906. 148 F. R. p. 838.)

PATENTS—INFRINGEMENT—ACTION AT LAW TO RECOVER PROFITS.

An action at law cannot be maintained for the sole purpose of recovering the profits which an infringer of a patent has made.

MILLOY ELECTRIC CO. et al. v. THOMPSON-HOUSTON ELECTRIC CO.

(Circuit Court of Appeals, Sixth Circuit. November 20, 1906. 148 F. R. p. 843.)

1. PATENTS—REISSUE—DELAY IN APPLICATION.

A patentee who is entitled to a reissue is required to exercise his right promptly upon the discovery of the error which renders such reissue necessary; and where he continues litigation for years in various courts on his original patent, after it has once been adjudged invalid, he will be deemed to have elected to stand upon such patent as the measure of his rights, and cannot thereafter obtain a valid reissue.

2. SAME—TRAVELING CONTRACT FOR ELECTRIC RAILWAYS.

The Van Depoele reissue patent, No. 11,872 (original No. 495,443), for a traveling contact for electric railways is void because of the delay in making application therefor, which was not until seven years after it had been declared invalid by a Circuit Court of Appeals, during which time the owner was prosecuting suits for infringement in other circuits.

VOIGTMANN et al. v. WEIS & RIDGE CORNICE CO. et al.

(Circuit Court of Appeals, Eighth Circuit. October 30, 1906. 148 F. R. p. 848.)

1. PATENTS—INVENTION.

It is not invention to merely extend the use of an old combination of elements, where no new result is produced and no new method of producing the old result.

SAME.

The utility, public acceptance, or magnitude of sales of a patented article can only be considered on the question of invention, when such question is otherwise doubtful.

3. SAME—FIREPROOF WINDOWS.

The Voightmann patent, No. 600,186, for automatically closing fireproof windows, covers a combination of old elements previously used, in some instances in the same combination, for analogous purposes, and is void for lack of patentable invention.

FITZGERALD MEAT TREE CO v. MORRIS et al.

(Circuit Court of Appeals, Seventh Circuit. October 24, 1906. 148 F. R. p. 854.)

PATENTS—INVENTION—MEAT TREE.

The Oehmen patent, No. 688,674, for a meat tree is void for lack of patentable invention, in view of the prior art and of prior devices used to display goods, practically the same in construction and mode of use.

WESTERN ELECTRIC CO. v. GALESBURG UNION TELEPHONE CO. et al.

(Circuit Court, N. D. Illinois, S. D. February 14, 1905. 148 F. R. p. 857.)

PATENTS—DOUBLE PATENTING—TELEPHONE SWITCHBOARDS.

The Scribner patent, No. 669,708, for apparatus for telephone switchboards, consisting essentially of a "visible test" system for indicating automatically whether a particular line is open or busy by means of electric lamps, discloses invention, although of narrow scope in view of the prior art, but is void for double patenting: patent No. 574,006, to the same patentee, applied for later, but granted prior to No. 669,708, although claimed to be for a "combination" of an audible and a visible test system of signals, disclosing the device of the later patent in its entirety, with neither elements nor functions modified or changed by the added feature for audible. Also held not infringed. if conceded validity.

RUMFORD CHEMICAL WORKS v. HYGIENIC CHEMICAL CO.

(Circuit Court, D. New Jersey. December 7, 1906. 148 F. R. p. 862.)

1. JUDGMENT—PERSONS CONCLUDED—PRIVIES IN SUIT FOR INFRINGEMENT OF PATENT.

The rule that one not a party to a suit for the infringement of a patent may be bound as a privy by the judgment or decree therein applies only to cases where, by agreement, a joint defense is made or a principal defends his agent, or a licensor his licensee, or other like relation contractual or representative exists. One is not bound as a privy merely because he contributes to the defense, without having the right to control the proceedings or to appeal from the judgment or decree.

2. EVIDENCE — TESTIMONY OF DECEASED WITNESS—MODE OF PROOF.

The testimony of a deceased witness given in another case cannot be shown in a subsequent suit merely by producing a witness who testifies to the correctness of the printed transcript of such testimony as contained in the record in the prior suit, and then putting into the record such parts of such printed testimony as counsel may deem material or important to his case.

3. PATENTS—CONTRIBUTORY INFRINGEMENT.

A defendant cannot be charged with contributory infringement of a patent for a baking powder merely because of the sale to an infringing manufacturer of an article which constitutes an element in the patented product, but which is also a common article of commerce, used for other purposes, without convincing proof that the article sold was used in the manufacture of the infringing product, and that defendant sold it knowing, or having reasonable cause to know, that it was to be so used.

SCHNAUFFER v. ASTE.

(Circuit Court, S. D. New York. December 4, 1906. 148 F. R. p. 867.)

1. EQUITY—PLEADING—SETTING DOWN PLEA FOR ARGUMENT.

By setting down a plea for argument, the complainant admits the facts pleaded therein.

2. PATENTS — SUITS FOR INFRINGEMENT—PLEA.

If a plea is to be allowed in a suit for infringement of a patent in any case, it should reduce the issue to a single point, so that, conceding the facts to be as settled by the bill and plea, a full and final determination may be had, and unless it does so, and fully meets the equities of the bill, it will be overruled.

STEINER v. SCHWARZ.

(Circuit Court, S. D. New York. November 30, 1906. 148 F. R. p. 868.)

1. PATENTS—VALIDITY AND INFRINGEMENT—DOLL.

The Steiner patent, No. 695,121, for a doll in which there is a combination of a walking mechanism and a sitting mechanism, with an apparatus making the legs rigidly perpendicular when walking and rigidly fixed at right angles to the body when sitting, was not anticipated, and discloses patentable invention; also held infringed.

2. SAME—ANTICIPATION—FOREIGN PATENT.

The instrument known under the German law as a "Gebrauchsmuster" is not one the filing of which charges any one with notice of its contents or which has the effect of a foreign patent as an anticipation of a subsequent United States patent.

BROWN BAG-FILLING MACH. CO. v. DROHEN.

(Circuit Court of Appeals, Second Circuit. March 6, 1906. 148 F. R. p. 985.)

PATENTS — INFRINGEMENT — BAG-FILLING MACHINE.

The Cummings patent, No. 539,171, for a bag-filling machine, held valid and infringed as to claims 14, 53, 54, 30, 24, 53, 61, 41, 11, 12, 16, 17, 19, 23, 34, 35, and 20, but not infringed as to claims 1, 2, 6, 13, 8, 9, 18, 29, and 75, which each contain as an element a flexible bag opener not found in defendant's machine.

SIEGERT v. GANDOLFI et al.

(Circuit Court of Appeals, Second Circuit. December 4, 1906. 149 F. R. p. 100.)

1. TRADE-MARKS—GEOGRAPHICAL NAMES—ANGOSTURA BITTERS.

Complainants adopted the name "Angostura" as the name of bitters originally manufactured by them in the town of that name in Venezuela, and continuously used the same thereafter, though the name of the town was subsequently changed. Complainants' bitters became widely and favorably known under such name. Held, that complainants were entitled to protection in the use of the name as against persons using it to create dishonest competition, though complainants could not obtain a monopoly in the use of the word as a trade-mark.

2. SAME—UNFAIR COMPETITION—IMITATION OF PACKAGES.

Where defendants imitated both the name and bottles in which complainants' "Angostura" bitters were sold, the labels being similar, except that they disclosed the fact that defendants' bitters were made in Baltimore, Md., instead of Port of Spain, in Trinidad, where complainants' bitters were made, defendants were guilty of unfair competition.

3. SAME—RIGHT TO PROTECTION—FRAUDULENT REPRESENTATION.

Complainants manufactured and sold "Angostura" bitters under representations that it consisted of a mixture of certain bitter, aromatic, and carminative substances, together with alcohol added as a preservative solvent, and that the bitters did not contain any "intoxicating ingredients." An advertising circular contained certificates of physicians and customers, representing that the bitters were a valuable remedy for nearly all ills, and when mixed with water, beer, wine, and spirits, made a "splendid drink," and also that the bitters were free from dangerous ingredients and might be used by invalids, adults, and children to advantage. Held, that the statement that the bitters contained no intoxicating ingredients should be construed as referring to the herbs and simples of which it was composed, and that such representations were not so false and fraudulent as to deprive complainants of relief in a suit to enjoin unlawful competition.

WILDMAN MFG. CO. v. ADAMS TOP CUTTING MACH. CO.

(Circuit Court, of Appeals, Third Circuit. November 20, 1906. 149 F. R. p. 201.)

CONTRACTS—BREACH—IMPLIED CONDITION.

A contract by which one party was constituted the sole manufacturer and the sole sales agent for a machine under a patent owned by the other, and required to manufacture and have ready for delivery at least 50 machines each year, provided there was a sale for such number, placed upon such agent, by implication, the duty of exercising reasonable diligence in endeavoring to market the machines, and rendered it liable for a breach of the contract if by reason of its failure to do so the required 50 machines were not manufactured and sold each year.

BELL v. MacKINNON et al.

(Circuit Court of Appeals, Second Circuit. November 7, 1906. 149 F. R. p. 205.)

1. PATENTS—SUIT FOR INFRINGEMENT—DEFENSE OF ANTICIPATION.

The defense of anticipation will not be considered in a suit for infringement of a patent where it is supported by the introduction of a number of prior patents for complicated machinery without any explanatory testimony.

2. SAME—INFRINGEMENT—KNITTED FABRIC.

The Bell patent, No. 599,438, for a knitted fabric, if conceded patentable novelty, is of very narrow scope, and is not infringed by a fabric which has neither the groups of short and long loops of plush thread of the specification, nor the short and long loops of the claim.

SMYTH MFG. CO. v. SHERIDAN et al.

(Circuit Court of Appeals, Second Circuit. November 7, 1906. On Rehearing, November 21, 1906. 149 F. R. p. 208.)

1. PATENTS—INVENTION—ADJUSTABILITY OF PARTS.

Merely making the parts of a machine adjustable with respect to each other does not constitute invention, but is within the ordinary ingenuity of a skilled mechanic.

2. SAME — NOVELTY — BOOK-SEWING MACHINE.

The Reynolds & Jacobs patent, No. 435,613, for a book-sewing machine for sewing the signatures of books together, claims 3 and 15, which are broad claims, covering a combination of detail parts not specifically described, except that they are adjustable, and the sewing devices generally arranged in groups, if given the broad construction imported by their terms, are void for lack of patentable novelty, in view of the prior art; the only novel feature being such adjustability.

3. SAME—SUIT FOR INFRINGEMENT—APPEAL.

Patents set up in the answer in a suit for infringement as a part of the prior art, printed and indexed in the record on appeal, and referred to in the briefs, and in relation to which witnesses were examined, and without objection, will not be excluded from consideration by the Appellate Court because they were not formally marked as exhibits by the examiner.

HOE et al. v. MIEHLE PRINTING PRESS & MFG CO.

(Circuit Court of Appeals, Second Circuit, November 7, 1906. 149 F. R. p. 213.)

PATENTS—INFRINGEMENT—PRINTING PRESSES

The Read patent, No. 688,690, for improvements in bed motions for cylinder printing presses, is not for a pioneer invention, and as limited by the prior art held not infringed.

SWIFT v. PORTLAND BRUSH & BROOM CO. et al.

(Circuit Court of Appeals, Seventh Circuit. October 29, 1906. 149 F. R. p. 216.)

PATENTS—INFRINGEMENT — CELL-CASE MACHINE.

The Swift patent, No. 622,403, for a cell-case machine for the manufacture of cell cases or fillers for crates used in the transportation of eggs or fruit. Claim 1 is void for lack of novelty and invention in view of the prior art. Claim 19 conceding its validity, held not infringed.

BALL BEARING CO. v. STAR BALL RETAINER CO.

(Circuit Court of Appeals, Third Circuit. December 6, 1906. 149 F. R. p. 219.)

PATENTS—INFRINGEMENT—BALL BEARINGS.

The Simonds patents, Nos. 449,965 and 449,959, for ball bearings, narrowly construed, as required by the prior art, held not infringed.

BATES MACH. CO. v. WM. v. FORCE & CO.

(Circuit Court of Appeals, Second Circuit. November 7, 1906. 149 F. R. p. 220.)

PATENTS—INFRINGEMENT—NUMBERING MACHINES.

The Bates patent, No. 676,084, for an improvement in typographic numbering machines, narrowly construed as required by the prior art, held not infringed.

UNITED STATES FASTENER CO. v. BRADLEY.

(Circuit Cuurt of Appeals, Second Circuit. November 7, 1906. 149 F. R. p. 222.)

1. PATENTS — INFRINGEMENT — SEPARABLE BUTTON.

The Pringle patent, No. 580,000, claim 1, for a separable button catch, designed for use with a stud member, to form a separable button or fastener, was not anticipated, and discloses patentable invention. Also held infringed.

2. SAME—SUIT FOR INFRINGEMENT—EFFECT OF NONUSE OF PATENT.

Where a patented device is obviously operative and useful, the fact that it has never been manufactured by the owner of the patent does not affect his right to maintain a suit for infringement.

UNITED STATES FASTENER CO. v. STAHEL et al.

(Circuit Court, S. D. New York. December 18, 1906. 149 F. R. p. 225.)

PATENTS—INVENTIONS—BUTTON.

The Kempshall patent, No. 565,276, for a button or snap fastener, is void for lack of novelty or patentable invention in view of the prior art.

In re OUTCALT.

(Circuit Court, S. D. New York. November 15, 1906. 149 F. R. p. 228.)

PATENTS — CONTEST IN PATENT OFFICE — POWER OF COURT TO ISSUE SUBPŒNA DUCES TECUM.

Rev. St. § 4906 [U. S. Comp. St. 1901, p. 3390], providing for the issuance by the clerk of any federal court of subpœnas for witnesses within the district for the taking of testimony for use in any contested case pending in the Patent Office, does not authorize the issuance of a subpœna duces tecum; nor is such subpœna authorized in such proceeding by Rev. St. § 716 [U. S. Comp. St. 1901, p. 580], which deals only with writs necessary for the exercise by the courts of their own jurisdiction.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Frank Sherkel, Houtzdale, Pa. Safety Hook.—The hook consists of a body having an eye at one end, and a tongue projecting longitudinally from one of the corners of the other end. An outwardly swinging retaining hook is pivoted between its ends to the other corner, and has an offset bill that coacts with the free end of the shank. A spring-pressed locking device is located in the body and cooperates with the inner end of the hook to normally lock it against movement. This device has a projecting portion which can be operated to release the hook and thus permit the opening of the same.

David Jones, New Castle, Pa. Railroad Rail.—The object of the present invention is to provide a rail, which is practically continuous and in which no fish plates or like connections are necessary. It consists of a tread head, a base flange, and a web connecting the same, and is divided into separate series of sections by an upright joint that extends centrally and longitudinally through the head, the web and the base flange. These series of sections have their opposing inner faces abutted throughout their extent and have alternate ridges and furrows, the ridges of the sections of one series fitting into the furrows of the sections of the other series. Bolts pass transversely through the abutted sections and secure the same together.

Joseph Herr, Gibsonburg, Ohio. Shade Roller and Curtain Pole Support—The particular object of the inventor in this case has been to provide an exceedingly simple structure, made up of a minimum number of parts and permitting the relative adjustment thereof in order that the support may be readily applied and securely fastened to window frames of different sizes, at the same time, allowing for the positioning of the roller and pole in different relations. Frame-embracing clamp members are employed having overlapping slidably associated shanks provided with a longitudinally disposed slot. The pole supporting bracket has an offset lower end disposed transversely of the shanks and also provided with a slot. A roller supporting bracket is employed comprising an outstanding ear having an offset portion disposed longitudinally of the shanks and across the pole supporting bracket. This offset portion is provided with a slot. A holding bolt passes through the various slots, and a clamping nut threaded on the bolt, serves to prevent relative movement between all the parts; but by loosening the nut the parts may be adjusted.

William J. Huckabay, Sparta, La. Rail or other Joint.—The object of the present invention is to provide a joint adapted to connect the ends of rails without the use of fish plates, bolts, nuts, springs, and the like, and capable of enabling railroads to be rapidly constructed without placing cross ties beneath the ends of the rails. The device comprises two rails or members provided at their upper portions with a tongue-and-socket connection, the socket being open at one side, and the tongue forming a pivot on which the rails or members are adapted to be partially rotated to connect and disconnect them, said rails or members being provided adjacent to the tongue-and-socket connection with correspondingly-recessed interlocking parts adapted to be carried into and out of engagement with each other by the said rotary movement of the rails or members.

William T. McDermott and William F. Betzel, Baltimore, Md. Sheet Metal Window Frame.—It is the aim of the present invention to provide means for mounting pulleys in window or analagous frames, and particularly that type of window frames constructed of sheet metal, and to permit the ready removal and replacement of the pulley, should it become necessary to do so on account of the pulley becoming worn, deranged, or defective from any cause. It consists of a retaining plate having a seat in its inner side and an opening located at one end of the seat, a pulley support that passes through the opening, said support engaging over the front face of the plate and being provided with a tongue that passes through the opening and engages in the rear seat, means for securing the retaining plate to a frame or other support, means passing through the face plate and engaging the retaining plate for detachably securing the pulley support in place, and a pulley journaled in the support.

Louis Kleiber, Berlin, Wisc. Cream Can Submerger.—The device of this patent is adapted to receive a plurality of cream cans and hold them submerged in a cooling liquid. It prevents the cans from tipping over, even when they are not locked or fastened down to the bottom of the tank or other receptacle in which they are submerged. The apparatus comprises a can holder consisting of a can-receiving sleeve and spaced supported arms, bearing brackets mounted on the sleeve and located between the arms, and a locking device consisting of a shaft or spindle mounted in the bearing brackets, and a swinging arm located above the sleeve and arranged to engage the top of the can.

Julius E. Will, Bethel, Mo. Hay Stacker.—This invention relates to hay stackers, adapted, after a hay stack has obtained a considerable height, to dump the hay the desired distance upon the same, and it also provides adjustable means for controlling the movement of the fork for discharging the load on the desired portion of the stack. The device embodies a main frame, a swinging connecting frame mounted on the main frame, an oscillatory fork-carrying frame connected with the swinging frame beyond the pivotal point thereof, means for oscillating the swinging frame and the fork carrying frame, foldable supporting bars pivoted to the main frame and arranged to receive the connecting frame, and means for limiting the movement of the pivoted supporting bars.

Thomas Lynch, Jefferson, Iowa. Tips for Rocking Chairs.—The tip of this patent is adapted to be readily applied to rocking chairs without cutting, trimming, or otherwise altering the rockers thereof, and it is capable of preventing the same from scratching, marring or otherwise injuring or defacing articles of furniture, the baseboard of walls, and the like. The tip consists of a holder having a clamp arranged on the upper face of the rear end of the rocker and provided with an attachment plate secured to the lower face of the rear end of the said rocker, and arranged at an angle to the clip to form a crotch into which the rear end of the rocker fits, and a cushioning buffer held by the said clamp.

Jurgen Tanck, Pipestone, Minn. Canvas Tightener for Harvesting Machines.—The object of the present invention is to provide a canvas tightener designed for use on various kinds of endless conveyers, and capable of ready adjustment to regulate the tension of the canvas or other material of which the conveyer is constructed. The tightener comprises a frame provided at opposite sides with recesses and having slots or grooves forming ways, slidable bearing blocks located in the recesses and provided with arms fitted in the grooves, guards secured to the bearing blocks, carried by the same and extending from the inner ends of the bearing blocks to points beyond the recesses, and means for moving the bearing blocks inwardly and outwardly.

William T. Favorite, and Clarence V. Schermerhorn, Sturgis, Mich. Corn Popper.—The corn popper of this patent is adapted to be readily operated by an inexperienced person over any fire or heater, and capable of popping corn in seasoning material, and of enabling the unpopped kernels to be readily sifted out. The popper is ventilated to make the corn tender. It embodies a receptacle, and a metal strip secured to the lid or cover and having one end bent inwardly to form a lug or projection for limiting the sliding movement of the lid or cover, the other end being bent to form a handle.

Martin M. and Edward G. Johnson, Malta, Ill. Corn Huskers.—The corn husker of this patent is designed to form a rigid support for the wrist of the wearer to prevent the wrist from becoming greatly fatigued at the joint, and it is also adapted to support the hand and wrist from a point slightly in advance of the ball of the thumb to a point considerably above or in rear of the wrist joint, and capable of allowing free play of the fingers and thumb to permit the operator, when the hook has pulled the husks away from the ear, to grasp the latter without making an extra motion of the entire hand or arm. The husker comprises a flexible band, means for securing the band around the hand and wrist, and a plate consisting of a substantially oblong body portion having its front end extended laterally at one side and provided in rear of such extension with a laterally-projecting tongue, the front half of the plate being also curved longitudinally to fit the hand, and the rear half of the plate being substantially straight in longitudinal section to form a solid wrist-protecting portion, and being extended from a point below to a point above the wrist joint to prevent the wrist from bending thereat.

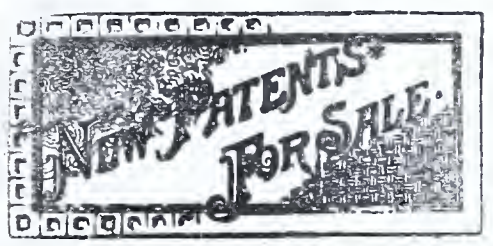
Wm. O. Garrett, Maryville, Mo. Stock Watering Apparatus — The stock waterer is designed to be connected with the water supply of a farm, and it is provided with means for automatically controlling the flow of water under any pressure. One of the objects of the invention is to provide a stock watering apparatus, in which the accumulation of sediment beneath the float of the valve will not operate to cause a leakage, and consequent waste of water. The water within the trough can be heated sufficiently to prevent it from freezing, whereby the apparatus is adapted to be used throughout the year at a very low cost. The tank embodies a depending flange, a heating chamber located beneath the tank and fitting within the said flange, whereby it is interlocked with the tank, a heating device, and a supply pipe piercing the heating chamber and the tank, and retaining the same in their interlocked relation.

John B. Williamson, Louisville, Ky. Condiment Holder.—It is the aim of this invention to provide a condiment holder, designed particularly for use as a salt or pepper shaker, and adapted to prevent its contents from coming in contact with metallic substances, and capable of effectually closing the apertures to prevent the discharge of its contents. It is also provided with means for securing the cap to the body of the receptacle, and for also enabling the cap to be readily adjusted to expose and cut-off the apertures, and to be removed when desired. The device comprises a body provided at its inner face with a groove extending downwardly from the upper edge of the body and forming a discharge aperture, and a rotary cap having a depending flange spaced from the pheripery of the cap and arranged to cover the inner side of the said aperture, and carried to and from such position by the rotary movement of the cap, the outer portion of the cap being arranged upon the upper edge of the body for closing the aperture at the top, and being cut away to provide an opening for exposing the aperture.

Louis Alden, Jr., Bryn Mawr, Pa. Can Opener.—The can opener of this patent is designed for use on all kinds of cans, and is capable of enabling a can to be readily opened. It is the aim of this invention to improve that class of can openers having a wire soldered in a severed portion of a can, and to enable such a wire to be soldered to the several portions of a can with greater ease and rapidity than heretofore. It comprises a receptacle having a V-shaped groove stamped in it, the metal being severed at intervals at the apex of the groove to form integral connecting portions, and a severing or unsealing wire soldered in the groove and fitting against the walls thereof and spaced from the apex of the groove and from the walls at the mouth of the same to provide solder receiving spaces.

John L. Friedman and John Graham, Lawton, Okla. Cattle Guard.—The inventors have provided a cattle guard adapted to be readily applied to a railway track, and capable of effectually preventing cattle from passing over it. They have also provided a guard adapted to substantially shade the road bed to prevent the growth of vegetation, so that the cattle will not be attracted to the cattle guard by any such growth. The cattle guard comprises a frame having side bars provided with bearings, large rotary members operating between the cross ties of a railroad track and mounted in the bearings of the frame, substantially inverted U-shaped bearing brackets mounted on the frame between the said bearings and provided at their tops with bearings arranged in pairs, and small rotary guard members arranged in pairs between the large guard members and journaled in the bearings of the brackets.

Jasper D. Smock, Terre Haute, Ind. Head Rest for Beds.—This head rest is designed particularly for use on metal beds, and is adapted to enable a person reclining upon a bed to be raised to a sitting or any reclining position with little effort on the part of the attendant or the patient. It is also provided with an attachment having locking means for retaining the head rest in its adjusted position, and these means are arranged within easy reach of the patient to permit the attachment to be released when it is desired to change the adjustment of the same. The device embodies supports consisting of longitudinal bars having upwardly extending arms, means for securing the supports to a bed, a hinged head rest mounted on the arms of the support, operating levers arranged in spaced relation with the head rest and located beneath the same, means for connecting the levers with the head rest, springs, flexible connections extending from the springs to the levers, and a tension device mounted on the supports and connected with the springs.



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FOR SALE—Patent No. 864,600 issued August 27, 1907. Also No. 108,518, issued Nov, 12, 1907. Improved Bedstead which is simple and durable. Will sell outright. Price aud information—Address, E. Blacknell R. F. D. No. 1, Box 52, Ferris, Tex. mar

FOR SALE—Patent No. 865,403, issued Sept. 10, 1907. Refrigerator with ice box filter and water cooler. Completely isolated from provision chamber so that drinklug water is entirely free from contamination. Great ice saver. Address, Wilfred Landry, 602 Soniat St., New Orleans, La. mar

FOR SALE—U. S. Patent No. 860,318, dated July 16, 1907. Fence wire stretching device, especially adapted for stretching wire around corner posts. For particulars address, E. E. Ostlund, Route 2. Pennock, Miun. mar

FOR SALE — Cotton-chopper, that will do the work. Can be attached to cultivator. Easy to handle. A Stalk-cutter — cheaply manufactured. Bends stalks and cuts them. Address, B. C. Lancaster, Waxahachie, Tex. mar

FOR SALE—Patent No. 833,032, dated October 9, 1906. Elevator. Useful for lowering and raising articles in cellar; also for unloading railroad cars, loading freight on ships, elevating ice from ice-house into wagons. Cau be attached to delivery wagons. Will sell outright or on royalty. Address, Joseph J. Fischer, Belle Plaine, Minn. mar

FOR SALE—U. S. Patent No. 861,872, dated July 30, 1907. A ventilator that can be used on board of ships, as well as on private or public buildings. Address, Roderick Macdonald, Fletcher Street, Glace Bay, N. S., Canada. feb

FOR SALE—Patent No. 864,065, dated August 20, 1907. Green Corn Husker. This machine will husk and silk in one operation. No butting. Does not soil or mutilate corn. Will sell outright. For particulars address, Charles Bennett, Mount Morris, N. Y. feb

FOR SALE—Patent No. 866,682, dated September 24, 1907. Bottle. Cannot be refilled without detection. Will sell outright for reasonable offer. Address, George H. Powell, Gardner, Kansas. mar

FOR SALE or lease on royalty—Patent No. 763,590, dated June 28, 1904; also Canadian patteut: Fruit Jar Wrench. Best there is. Make me an offer. Address, R. J. Berthoud, Swanton, Ohio. feb

FOR SALE—Patent No. 861,467, dated July 30, 1907. Machine Gun. For full particulars address, Leon Jusselin, Moreauville, La. jan

FOR SALE—Patent No. 862,875, dated August 13, 1907. Shoestring Fastener. Will sell outright for a reasonable offer. Address, Henry Behrens, Oakdale, Pa. feb

FOR SALE—Patent No. 831,216, dated Sept. 18, 1906. Car Step. For cash $15,000 or royalty. For further particulars address the inventor, George W. Davis, Denton, Texas. feb

FOR SALE—Patents No's 837,774 and 857,441. Wheel Flange Oiler and Trunk Rope Fastener. Both money makers if handled by right party. For particulars address, E. W. Carroll, Sasco, Ariz. Ter. jan

FOR SALE—Patent on Brooder, No. 856,696, issued June 11, 1907. A very valuable brooder. Chicks cau't crowd, or scratch litter into their sleeping quarters. Pleuty of fresh air without draft at all times. Address, D. K. Groff, Cerro Gordo, Ill. jan

FOR SALE—Patent No. 852,206, dated April 30, 1907. Rail Joint Chair for connecting the ends of a pair of rails. Dispenses with half the number of bolts. Other important advantages. For information address, G. W. Strother, Jenifer, Alabama. jan

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FOR SALE—Patent No. 865,773, dated Sept. 10, 1907. Automatic Pigeon Feed Hopper. A practical, economical, time and labor-saving device. The most satisfactory hopper on the market. Works automatically in opening and closing. Address, John R. Elliott, No. 811 Chestnut Street, Camden, N. J. feb

FOR SALE—Patent No. 860,794, dated July 23, 1907. Double shoulder strap, especially adapted for letter carriers, newsboys, bill distributers, sportsmeu, etc. Equalizes the weight of load upon both shoulders. Will sell outright or part cash with royalty. Address, Frank A. Felts, Oneida, N. Y. feb

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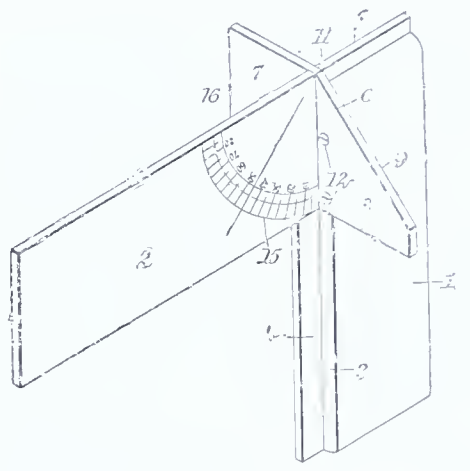
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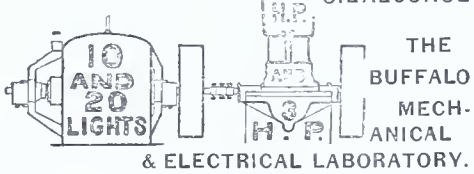
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WASHINGTON, D. C. JANUARY, 1908.

Our Iron Industry.

Most of us are aware that Uncle Sam's industrial supremacy is largely founded on iron. We know, in a general way, that our iron industry has brought uncounted wealth into the country; has created a steel trust; has made Pittsburg a city of multi-millionaires, and has been one of the factors in an economic revolution. But the change has been within the lifetime of the present generation: we lack the perspective of time in considering it, and for this reason those who are not intimately associated with the industry realize neither the extent nor the meaning of its growth. The man in the street knows that up to fifty years ago, our iron ore came from New York and Pennsylvania; and that the discovery of Lake Superior deposits was made just in time to supply the demand for railroad construction that followed the Civil War. But it is difficult to appreciate the character of these deposits. They are the largest in the world, but that is the least important of their attributes: they are in a form different from any others known. The ore is not buried deep in the earth: they cannot be spoken of as iron mines, for they are not mines at all. There are no deep shafts, no dark passages and caverns, no laborers toiling by artificial light. The Mesaba range, in Minnesota—which covers a tract of land twice as large as the state of Rhode Island—is as open to the daylight as a brickyard. Some of the workings have terraced sides, which gives them the appearance of huge amphitheatres: others are wide and shallow like the switching yard of a railroad: and some look like extinct volcanoes, their red sides torn open by the last explosion.

Nor is the iron ore here hard and rock like. It is not necessary to blast it loose, as is done in other ranges. The miner of the Mesaba is merely a man who operates a steam shovel. In another column there is published an article giving interesting details of the working of this ore. Eight workmen can handle one shovel, and under favorable conditions they can load more ore in one hour than five hundred delving miners can bring up in a day from the average rock mine.

A dozen years ago, there was not an iron mine in the world that had an output of half a million tons a year. Today, there are fifteen mines of Lake Superior that produce from one to three times as much. The Oriskany mine, in Virginia, was thought to be a record breaker when it produced a thousand tons a day: but a Mesaba mine turns out 15,000 tons a day for weeks together. The cost of mining has been beaten down to as little as twelve cents a ton.

The discovery of Lake Superior ore has changed the industrial map of the United States. It has opened up a new territory as large as France. It has shifted the center of the iron and steel trade from the Ohio River to the Great Lakes. It has built up eight railroads, more than a dozen busy towns, and the largest commercial fleet in the world. All this in less than fifty years.

Air Brakes.

Everybody has heard about the air brake, and whenever railway accidents occur there are frequent references to the action of the brakes, and the whole matter is discussed glibly. Yet, like many other devices in common use, few people really understand the air brake, and the following explanation is given for the benefit of the uninitiated.

The necessity of a brake which the engineer could control was suggested to George Westinghouse — then a young man just past his majority—by the sight of a collision between two freight trains. The old wagon brake was the principle upon which he worked, and instead of using steam, he decided to try compressed air in a motor cylinder under each car. When the brake was completed, railroad men refused to experiment with a brake worked "by wind." Finally a trial was made by the Panhandle railroad, and on the very first trip it prevented a collision. After that the way to success was short and easy for the young inventor. It was found possible, with his device, to make high speed on railroads, and a factory was established at Pittsburg.

The air brake works on the theory of the equalization of pressures. It has an air pump, which compresses the air. There is a main reservoir in which the air is stored, and an auxiliary reservoir which is supplied from the main reservoir. When the engineer wishes to apply the brakes, he turns a brake valve—which operates to regulate the flow of air—so that there is a moderate reduction of the pressure in the train pipe. This pipe connects the brake valve with triple valves under each car, the triple valve serving the purpose of applying the brakes simultaneously in a long train. The reduction of pressure in the train pipe causes the greater pressure in the auxiliary reservoir to force air into the brake cylinder, thrusting the piston out and applying the brakes. When the brakes are not in action, the pressure on the train pipe is made such as to prevent an escape of air from the auxiliary reservoir.

When it is desired to release the brakes, the engineer turns his valve in the opposite direction, permitting the air to flow from the main reservoir, located on the engine, into the train pipe. When the pressure, thus restored in the train pipe, is increased above the pressure in the auxiliary reservoir, certain valves are moved, communication is thereby restored between train pipe and auxiliary reservoir, the piston is forced to its normal position, air escapes from the brake cylinder, and the auxiliary reservoir is recharged through the train pipe.

When the train breaks in two or a hose-pipe connection is broken, it has the effect of a sudden and material reduction of the pressure in the train pipe, the same as though the engineer had made an emergency application. The sudden reduction of pressure also opens supplementary valves, which increase the pressure upon the brake cylinder about 20 per cent. The brake shoes are attached to rods, which are in turn attached to the piston in such a way that when the air from the auxiliary reservoir forces the latter out, a pulling force is exerted upon the brakes. The whole device, while simple in theory, is extremely effective, and one of the most ingenious of the inventions for use on railroads. It was the making of Westinghouse, who, instead of being an example of the poor inventor, stands today at the head of manufactories which represent an investment of a hundred million dollars. Not all of these produce air brakes, however, as Westinghouse has invented a number of electrical devices, and has just finished a 4,000 horse power locomotive, designed to pull heavy trains through the Pennsylvania tunnel under the Hudson river.

Wireless Telephones on Warships.

The fleet that is on its way to the Pacific is equipped with apparatus for wireless telephony. Experiments have shown that communications can be heard at a distance of over twenty miles. The system is the same in theory as that of the wireless telegraph, the voice being carried through the air on electrical waves generated by a dynamo, and radiated by the powerful current. It was found in the tests that ships equipped with wireless telegraph apparatus, but not with wireless telephones, could pick up and distinctly hear, through ordinary telephone receivers, what was said in the transmitter of the telephone on board of other ships.

In this connection, it may be noted that recent trials on land have demonstrated the practicability of talking at the same time over a regular telephone wire, and by wireless. A wireless transmitter was fastened to a regular telephone line, and two miles away a connection was made with the wire telephone, while a quarter of a mile from that point a wireless receiver was established. Words spoken into the wireless transmitter attached to the telephone wire were heard distinctly, not only by the person at the other end of the wire, but by another person stationed at the wireless receiver.

New Incandescent Lamps.

One of the most significant requirements of the civilization of the twentieth century, is that man shall be able to extend the day into the night. He can no longer go to bed with the sun, if he would keep abreast of his competitors. In order to meet this requirement there is great activity in the field of artificial illumination. New lamps are constantly being placed on the market; and during the last few months five or six of the incandescent type have been introduced, whose light-producing efficiency is considerably higher than the forms in use for many years past. Some of these new lamps, indeed, give three or four times as much light—taking into consideration the power involved—as the old style carbon lamps. All of them represent improvements in filaments, which are better than the carbon ones because they can be worked at higher temperatures, and are maintained by a less expenditure of energy; and also because a greater percentage of the total radiant energy exists in wave lengths to which the eye is sensitive; that is they produce a greater effect of light.

One of these new forms is known as the "metallized" carbon filament, in which the chemical composition of the filament has been altered so as to increase its strength and at the same time lessen its tendency toward evaporation. This means a much smaller amount of blackening of the interior of the bulb, and enables the life of the lamp to be limited by the time of actual rupture of the filament. In making this device, pure cotton is formed into soluble cellulose, which is squirted into jars of alcohol by automatic machines, and coiled as a continuous thread in the bottom of the liquid. This thread is dried, cut into suitable lengths, packed with pulverized peat, and subjected to intense heat. The filaments are then packed with powdered carbon in an electric tube furnace, and subjected again to a high temperature. They are then "flashed" (or raised to partial incandescence) in a rarified atmosphere of hydrocarbon vapor, again heated, and are then ready for use.

The other lamps are of quite a different character, employing such rare elements as tantalum, tungsten, etc., in their composition. Metallic tungsten is brittle and infusible, uniting with both carbon and oxygen at high temperatures. In the process of manufacture, the tungsten is held suspended in a finely divided state in such a solution as can be squirted into filaments. The solution contains binding material to allow the drying and welding processes to be carried on. In the tungsten lamp the electrical conductivity is high, and the color of the light emitted resembles that of acetylene gas. The changes in light production and power consumption are less for voltage fluctuations than in the case of the older carbon filament lamps. One of the drawbacks of this lamp, however, is its brittleness, which makes it difficult to ship.

Pure tantalum is difficult to obtain

and only by an expensive process. Its tensile strength is equal to that of the best steel. When the lamp is new, the filament appears as a fine, smooth wire. Later it undergoes structural changes, which may be called a kind of crystallization. This becomes accentuated by using the lamp on alternating circuits, and it increases with higher frequencies. The appearance under the microscope is such as to give the impression that the filament had repeatedly separated and immediately welded itself together again.

Another new lamp is of helion; this is composed to a great extent of silicon, which is at present deposited on a special carbon filament. The name applied to the lamp was given because of the striking similarity of the spectrum of its light to sunlight. Still another is made of osmium, which is a crystalline, non-ductile metal of such hardness that it will scratch quartz. It is made into filaments in a manner resembling that described for tungsten.

The Nernst lamp is more widely known, having been installed in many business establishments. The basis of Dr. Nernst's research was the fact that many substances which ordinarily are insulators, or at least very poor conductors, can conduct fairly well at high temperatures. Among such substances may be mentioned lime, magnesia, glass and certain rare earths. Their conduction of electricity is largely due to electrolysis. The glower of the lamp consists of several rare metals, such as thorium, yttrium, etc. The glowers are in the form of a short, thick filament, cemented to flexible platinum terminals by which it is suspended below and close to heating coils, which are porcelain tubes in which are imbedded resistance wires. These bring the glower up to the temperature where it begins to conduct, and are automatically cut out, at that degree of heat, by an electro-magnetic switch.

All these lamps burn brilliantly, and have been found commercially successful. It seems probable that these improved filaments may bring about radical changes in the electrical industry, as they mean not only better and more liberal illumination, but an extension of electric lighting into fields where it has been hitherto deemed too expensive.

Concrete Piles.

An illustration of the increasing use of concrete is given in the foundation for a plant now being constructed in Jersey City. It was required to be laid on filled-in ground, at the junction of the salt meadow and upland. To obtain a proper bearing the engineers had to go 20 feet below the existing surface, the ground-water level being 10 feet below. To carry a heavy concrete footing to the bearing stratum was too costly, and a timber pile foundation with a concrete cap was rejected for the same reason. It was finally determined to use concrete piles. A heavy pile driver was used to drive a hollow steel form, terminating in a patent jaw. When the form reached the bearing stratum, a small quantity of concrete was dropped inside and the form raised about a foot by a heavy pulling device. A heavy rammer was dropped on the charge of concrete, which caused the jaws to open, and forced the concrete out into the surrounding material. Another charge of concrete was inserted and the form again pulled up a short distance. This process was repeated until the form was entirely out of the ground, and the pile space was filled with concrete.

Concrete pile are especially suitable for wet or filled-in areas where the ground-water level is at a depth below the surface. In any other form of construction, it is necessary to excavate to the solid earth in order to start, or in the case of timber piles, excavation must be made to water level, the piles cut off and the pier built from that level. The concrete piles can make a foundation that costs 25 or 50 per cent less than when these methods are not used.

A Bridge in a Tunnel.

The latest engineering novelty is a bridge under the towering mass of a mountain. The big tunnel under Lookout Mountain at Chattanooga, Tenn., 3,400 feet long and wide enough for four tracks, has just been completed. In the midst of it a curious obstacle was met in the form of a huge cavern, so deep that it could not be filled in for the tracks. It was consequently decided to throw a bridge across it—a feat entirely new in the history of railroad work.

The Highest Building.

The highest structure ever erected by the hands of man, with the single exception of the Eiffel Tower, has just been completed in New York. It is nearly three-fourths as high as the famous thousand-foot tower, and is even more remarkable in that, instead of being an open frame work of iron, it is a building with hundreds of rooms fitted and equipped for use as offices. As might have been expected in this age of commercialism, it was built as an advertisement, and is the property of the Singer Manufacturing Company.

The foundation of this mass of steel and concrete was laid on bedrock, 90 feet below the surface. The main body of the building has 14 stories, and the tower rises up to the dizzy height of forty-seven. There are office rooms all the way to the top. Ten thousand tons of steel were used in the framework, and eighteen elevators will accommodate the occupants of the offices. Only one minute will be required to run from the sidewalk to the top of the structure. Fifteen miles of pipe will be used for steam and water purposes. On the pinnacle of the tower will be located a powerful searchlight which will be visible 60 miles away. As descriptions of the building will be published in papers all over the world, it will be an effective advertisement for the company.

An Electric Highway.

A great highway—in some respects the most wonderful in the world—stretches through the heart of New York state, from Niagara to Syracuse. It is 160 miles in length and from 100 to 300 feet wide. It was extremely expensive to construct, and it is patrolled night and day and kept constantly in repair. Yet the traveling public knows nothing of it. Never a wheel turns over its entire length, and no one can see or hear anything passing along it. Nevertheless, it is a great highway, for over it constantly passes an invisible current of electricity strong enough to do the work of almost 100,000 horses.

The construction of this road was a marvel of engineering. A private right of way was purchased, 300 feet wide at Niagara and 100 feet at the end of the line. This will permit the building of similar lines and the sending of power to other points. Great steel towers rise every 550 feet, except at curves, where they are set closer. Each tower weighs 3,000 pounds, and is 55 feet high. Insulators, each weighing 75 pounds, are carried on the towers, and on these are supported huge aluminum cables which carry a current at a pressure of 60,000 volts. These cables have 19 strands each, and were tested for every sort of strain before they were put into use. A private telephone extends the length of the line, with stations for messages at each fifth tower; and the line is regularly patrolled by a repair force. There are 11 substations along the way, where the power is stepped down for industrial work. At each station, lightning arresters—or discharges of static electricity — are put in. All this is significant of the development of industries which will make Niagara the electric power center of the world, until the Dark Continent is civilized, and the Victoria Falls made available for general power distribution.

Why Iron Rusts.

Ask almost any intelligent man why iron rusts, and he will probably explain at tedious length that it is all due to the oxygen of the air. Ever since chemistry became a more or less exact science, which was over a century ago, that theory has been generally accepted. Now an American physicist, Dr. Cushman, comes along and announces that rusting is really due to electricity.

Dr. Cushman started his researches with the object of discovering some method of preventing the corrosion of wire fences—a subject of vital interest to farmers. He achieved more than he anticipated. He found that the first attack on the iron is made by hydrogen in the form of exceedingly small particles, but not as the text-books have taught us, by oxygen. This is an agreement with the modern theory that many substances, when they are dissolved in water, are disassociated into ions, or minute particles smaller even than atoms, all carrying electrical charges. Even pure water contains a certain number of these. Acid impurities multiply the hydrogen ions and strengthen them in their corrosive effect upon iron. The action is purely electric, and involves an exchange of the electric relations between the hydrogen and the iron. Dr. Cushman discovered that active oxidizing agents, such as chromate and bichromate of potash, prevent rusting by safe-guarding it against attack by the hydrogen ion. By immersing the iron in a concentrated solution of bichromate acid, and then washing and wiping it, the metal is rendered passive, so that it becomes capable of resisting electro-chemical attack.

The discovery of the real cause of rusting and of its prevention has great industrial significance. It means that a method has at last been found for protecting structural ironwork and machinery.—*The Circle.*

Great Russian Canal.

Since the United States is interested in the construction of canals, it is worthy of note that Russia is about to undertake an enterprise which, while entirely different in character, is almost as colossal as that at Panama. For years there has been talk of a canal to connect the Baltic and Black Seas, but it has always been considered the dream of a visionary, to cut through the heart of the great Empire and connect the waters that wash the frozen coasts of Norway with those adjoining the Bosphorus. But the government has finally made plans and appropriations for the construction of the canal, the estimated cost of which is $38,000,000. The total length will be 1,500 miles.

Refining Tin.

Nearly all metals are now refined by means of electricity, but tin represents an exception. The reason is that in dressing tin ores, they are purified to such a degree that the smelting process yields very pure tin which does not need any further refining. However, attempts have been made to refine tin electrolytically, and on account of the novelty of the operation, a short description may be of interest.

One of the difficulties of the process is that a circulation of the solution, such as is used in the refining of copper, is impossible for tin. Every tank must be operated independently. The anodes and cathodes (or positive and negative poles) are suspended in a bath of sodium sulphite, and steam turned on. At the proper temperature the circuit is closed. The electric current is increased slowly for about two weeks, when it is turned off and the electrolyte allowed to flow out slowly. When the bath is empty, new electrodes are introduced and the process repeated. The expenses are heavy, and the process will hardly pay on a commercial scale, unless raw tin can be obtained at a lower price than the market cost of pure tin.

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Advertising device ..... M. Rosenfeld
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Borate of hexamethyleneamin and making same ..... O. Mankiewicz et al
Boring machine ..... M. L. Andrew
Boring machine ..... E. C. Mueller
Bottle. Non refillable ..... E. C. Mueller
Bottle. Non refillable ..... R. J. Patterson
Bottle. Non refillable ..... A. E. Sutton
Bottle. Non refillable ..... E. L. Southwick
Botele rinser and sterilizer ..... D. E. Shaw
Bottle stopper ..... J. J. Fraser
Brake actuating appliance to operate when a vehicle leaves the track in railways ..... G. S. Morison
Breast strap slide ..... N. Durand
Brick kiln ..... J. J. P. Casey
Brooder ..... S. G. Robinson, Jr
Broom corn bundling or compressing machine ..... J. F. Foley
Brush backs. Supporting table for boring holes in ..... W. G. Liebig
Bucket. Clam shell ..... J. Rogers
Buckle ..... K. Ginchowski
Buckles to belts or girdles. Means for attaching ..... F. B. Montgomery
Buggies. Jump seat for ..... G. D. Potts
Building apparatus and method of building construction ..... W. Peabody
Building block ..... W. W. Birnstock
Building block and wall ..... W. W. Birnstock
Building block making machine E. H. Somers
Building block mold ..... C. J. T. Cordes
Building construction ..... J. Mularkey
Building ventilator ..... J. Benton
Bushings. Tool for removing J. L. Alspaugh
Button. Collar ..... E. T. Atwell
Calculator ..... C. H. Ocumpaugh
Calendar ..... W. T. Berry
Calendar ..... J. Ferreres
Canning apparatus ..... N. W. Tharp
Canning machine cap feeding mechanism ..... N. Nelson
Cane ..... W. Autenrieth
Car. Box ..... C. W. Gill
Car brake. Railway ..... S. A. Crone
Car door ..... R. Hall
Car door. Grain ..... W. R. Smith
Car. Dump ..... O. W. Meissner
Car. Dumping ..... J. Bennett
Car. Dumping ..... J. M. O'Keily
Car. Dumping ..... W. L. Phillips
Car grain door ..... C. E. Mapes
Car inclines. Safety stop or chock for F. Post
Car. Motor ..... S. Otis et al
Car pusher ..... A. E. Brown
Car safety device ..... G. W. Sayre
Car stanchion ..... R. P. De Remer
Car step. Folding ..... W. G. Felkner
Car wheel ..... J. A. Pilcher et al
Car wheel ..... F. K. Vial
Car wheel locking attachment. Tram ..... T. Parker
Cars. Antifriction center bearing for ..... J. C. Barber
Carbureter. Gasolene ..... A. Winton
Card. Playing ..... L. Healy
Carriage. Folding baby ..... A. B. Todd
Carrier ..... G. Fink
Cartridge box. Multiple ..... H. R. Lemiy
Cartridge carrier ..... E. E. Drake
Cartridge from explosive gelatin. Maching for forming a ..... G. P. Jones
Cartridge holder ..... A. L. Hockett
Chair and desk. Combined ..... L. P. Agnew
Checking device. Cigar sale ..... J. H. Bowe
Checkrein hook ..... J. B. L. Brown
Cheese cutter ..... W. F Kessler
Chimney valve construction .... W. O. Amsler
Chuck. Drill ..... A. J. McAllister
Chute ..... C. N. Langdon et al
Cigarette machine ..... S. Ragona
Cigar, stogy, &c ..... A. H. Graves
Clasp ..... F. Freiman et al
Cleaning device. Pneumatic .... W. J. Bergens
Clock. Alarm ..... P. Lux
Cloth cutting machine ..... F. J. Clark
Clothes drier ..... S. E. Wilson
Clutch mechanism ..... P Jenness
Coal cabinet ..... R. R. Faulkner
Coin counter ..... B. Cranner
Coke pulling apparatus ..... F. M. Hogg
Collar fastener ..... S. R. Hewitt
Collar stiffener for negligee shirts ..... W. S. Peacock
Column ..... J. Lally
Column for fireproof construction .... J. Lally
Combustion process ..... B. E Eldred
Concrete block molding machine .. J. Ingells
Concrete chimney ..... J. W. Rector
Concrete construction. Reinforced E Nichols
Concrete mixing machine .... G. D. Scheiffler
Concrete pile and means for driving same .... J. Stewart
Concrete walls. Means for frost proofing .... J. H Walzl
Condenser ..... J. Zellweger
Contact shoe. Third rail .. S. B. Stewart, Jr
Control system ..... L. M. Aspinwall
Controller ..... E. W. Stull
Conveyer driving mechanism ..... G. von Hanffstengel
Conveying apparatus ..... 4 pats J. T. Cowley
Cooking utensil ..... J. W. Brown
Copying machine ..... F Soennecken
Core box ..... A. J. Bazely
Corset stay ..... H. M. McCormick
Cotton gin ..... J. Hodgkinson
Cotton picker ..... N. A. Gaston
Crate. Knockdown ..... J. Follansbee
Culinary device ..... G. M. Smith
Cultivator ..... W. H. Daniel
Cultivator ..... I. A. Weaver
Cultivator knife attachment. Corn .. J. Meyer
Cultivator shield ..... G. E. Barrett
Current apparatus. Alternating ..... A. S. Hubbard
Curtain hanger, Lace ..... T. McCormick
Curtain pole ring ..... J. A. Rings
Curtain pole support ..... E. S. Pearson
Curtain stretcher clamping device ..... H. A. Schwarz
Curtain support ..... M Keith
Cycle engine Double two ..... W. L. Morrow
Damper attachment ..... J. W. Reynolds
Dental engine ..... J. F. Hardy
Dental engine ..... W. E. Hanson
Dental engine handpiece ..... J. F. Hardy
Dental grinding tools. Stone guard for ..... F. W. Chandler
Dental impression pliers ..... M. A Robbins
Display easel .... reissue ..... J. E. Twitchell
Display rack ..... R. L. Wilcox
Door lock. Pocket ..... J. J. Baxter
Draft equalizer ..... A. Bush
Draft gear. Friction ..... L. Simpson
Draft rigging. Frictional ..... C. A. Tower
Drawer guide ..... M. Rubin
Dredge cutter. Suction ..... J. F. Oilrich
Dredging apparatus ..... E. B Stoddard
Driving dog ..... 2 pats .... S. W. Putnam, 3d
Dry cells. Making ..... P. L. Meyer
Duplicating pad and holder ..... A. McCaskey
Dust removing pneumatic machines. Regulating device for ..... J. R. Blum
Ear muff ..... S. R. Wells
Egg beater ..... W. Ruppel
Electric currents. Transformation of ..... W. T. Taylor
Electric furnace ..... G. Gin
Electric heater ..... G. E. Stevens
Electric heating fabric ..... W. Richmond
Electric machines. Series shunt for dynamo ..... E T. Mug
Electric motor ..... J. P. Hayes
Electric regulator ..... A. H. Barber
Electrical apparatus ..... T. W. Varley
Electrical apparatus clip ..... H. Kaantz
Electrical distribution system ..... A. S Hubbard et al
Electrical distribution system ..... E. Van Wagenen
Electrical distribution system W. E. Winship
Electrical distribution system ..... A. S. Hubbard et al
Electrode. Arc .... 2 pats ..... R. Fleming
Electrothermal protectors, Automatic testing and resetting means for ..... F. B. Cook
Elevator ..... R. H. Pascoe et al
Elevator. Electrically controlled C. T. Westlin
Engine cooling system. Internal combustion ..... F. G. Hobart et al
Engines. Hot head for explosive C. L. Smalley
Engines. Ignition system for explosion ..... R Varley
Envelop ..... W. B. Hawbaker
Eyeglasses ..... reissue ..... G. H. Chapel
Eyeglass fittings ..... G. Moore
Excavating and filling mechanism ..... W. Z. Laughterback
Excavators. Spud and hoisting frame for ..... J. P. Karr et al
Explosive engine ..... J. D. Anderson
Extensometer ..... W. H. Kenerson
Fastening clamp ..... S. I. Feinberg
Feed trough ..... C. W. Leonard
Fence post. Metallic ..... C. Colvin
Fender ..... J. A. Sage
Ferrochromium. Manufacture of ..... H. W. C. Annable
Fibrous material and separating dust therefrom. Apparatus for grading .. E. Slade et al
File ..... J. C. Dawson
Filing machine ..... F. C. H. Strasburger
Filter ..... L. R. Clark et al
Filter. Submerged ..... G. W. Durbrow
Filtering apparatus ..... D. J. Kelly
Fire extinguisher ..... G. E. Tilford
Fire extinguishing apparatus ..... C. E. Buell
Fire resisting curtain and channel therefor .. E. H. McCloud
Fireplace heater ..... H. D. Frisibe Sr
Fishing bait. Artificial ..... E. J. Haverly
Fishing reel ..... 2 pats ..... L. Atwood
Flower pot ..... C. J. Schmidt
Flue sections. Means for connecting ..... V. C. Howe
Fluid brake ..... W. Heilemann
Fluid pressure brake ..... R. A. Parke
Flue pressure brake ..... G. Westinghouse
Fluid pressure motor ..... S. Otis
Flushing cistern ..... T. Smith
Folding box ..... B. Rapeport
Folding box ..... J. T. Ferres
Food product ..... J. H. Kellogg
Frequency changer ..... W. S. Braliey
Fuel economizer ..... E. B. Freeman
Furnace ..... T. S. Blair, Jr
Furnace ..... J. & J. R. Eynon
Furnace attachment ..... B. F Herr
Furnace door ..... C. J. F. Johnson
Gage ..... V. V. Hawley
Gage ..... J. L. Pringle
Gage attachment. Automatic stop ..... W. A. Kramer
Game apparatus ..... M. Maris
Game counter ..... E. C Hillyer
Gang plank ..... E. V Rideout
Garment clasp ..... J. P. Wilson
Garment hanger ..... F. P. Johnson
Garment hanger support ..... H. N. Drucker
Garment supporter ..... H. T Sprague
Garter ..... G. L. Burton et al
Gas apparatus. Water ..... J. H. Taussig
Gas burner. Blast ..... J Simmendinger
Gas conduit connecting device C. de Hoffmann
Gas cut off. Automatic .... E. A. McDonough
Gas engine ..... W. L. Morrow
Gas engine ..... R. W. Powell et al
Gas generator ..... W. M. Cross
Gas generator. Acetylene ..... J. Margreth
Gas governor and street pressure changer. Automatic ..... A. A. Yankee
Gas, Making ..... B. E. Eldred
Gas making apparatus ..... L. P. Lowe
Gas pressure regulating device ..... G. Dalen
Gas. Producing ..... B. E. Eldred et al
Gate ..... C. E. Rife
Gear. Change speed ..... C. B King
Gear cutter ..... G D Marvin
Gelatin forms or molds, Producing ..... 2 pats ..... A. Leuchter
Glassware. Machine for making hollow ..... S. E. Winder
Globe manipulator ..... J. Gaynor
Grading machine ..... C. D. Edwards
Grading machine ..... G. W. Barnett
Grain door ..... H. H. Boenker
Grain drill cleaner ..... R. M. Richards
Grain milling apparatus . G. E. Chamberlain
Grass catcher ..... J. H. Coult
Grinder. Mower knife and tool ..... J. M. Ross
Hammer nail holder attachment G. W. Fowler
Hand hole cover ..... K. Park
Harness attachment. Draft ..... W. E Perry
Harrow attachment ..... E. Schultz
Harrow, pulverizer, and drag. Combination .. A. D. Ulery
Harrow tooth ..... L. W. Fair
Harvester. Beet ..... H. M. Heilig et al
Harvesters. Counting mechanism for grain .. W. H. Crane
Hat, coat, and umbrella rack .. G. W. Hartman
Heading machine ..... H. A. Powers
Headlight adjusting device ..... F. P. Cobham
Headlight or lantern ..... F. P. Cobham
Heat. Reducing compounds with electrically-developed ..... F. J. Tone
Heat resisting composition ..... G. De Angelis
Heel. Boot and shoe ..... W. G. Anderson
Hinge ..... C. W. Cook
Hinge. Invisible ..... E. M. Kluge
Hoist. Portable ..... W. Connelly
Hoof expanding pad ..... C. D. McAfee
Horseshoe ..... G. M. Green
Horseshoe calk ..... J. M. McKnight
Horseshoe calk. Removable ..... A. E. Rehrig
Hose or pipe coupling ..... C. F. Snyder
Hose supporter ..... E. Pearl
Hub Sand proof disk ..... E. L. Black
Hydrosulfite mixture. Stable dry ..... A. Rinckenberger
Hygienic cartridge battery ..... W. Thompson et al
Incubator ..... J. W. Nott
Incubator alarm attachment ..... C. R. Benedict et al
Index ..... R. C. Russell
Index card holder ..... F. Burns
Insect trap ..... I. E. De Haas
Insulated joint ..... F. E. Kinsman
Insulating coupling ..... A. W. Berresford
Insulating material and manufacturing same ..... R. Mulier
Insulator. Strain ..... 2 pats ..... A. Anderson
Journal box and lid ..... F. C. Sorensen
Label affixing machine ..... C. H. Booton
Lacing Shoe ..... A. Caldwell et al
Lamp filaments to the stem wires. Apparatus for cementing electric .. 2 pats .. N. Marshall
Lamp. Hydrocarbon ..... J. Landsiedel
Lamp mantle holder ..... J. M. Simmons
Lamps. Multiple socket for incandescent ..... F. J. Russell
Land roller ..... J. Wolfinger
Lantern, Electric ..... F. P. Cobham
Lathe. Double arbor ..... D. Bacon
Launches. Adjustable top for .. W. P. Walter
Laundry iron ..... J. R. Adams
Letter box ..... W. H. Hushour
Lineman's safety device ..... W. F. Newton
Liquid cooler ..... J. D Spencer
Liquid dispensing vessel ..... H. Waechter
Liquids from vapors. Apparatus for separating ..... H. W. Aitken et al
Loading apparatus ..... F. M. Hogg
Lock ..... W. H. Taylor
Locomotive boiler ..... S. A. Reeve
Locomotive tank siphon ..... C. W. La Rue
Loom shuttle ..... W. L. Hall
Loom stop motion mechanism. Faller for .... J. B. Whitney et al
Loom. Weft replenishing .... B. F. McGuiness
Lubricant controlling device. Auxiliary automatic ..... H. Odermann et al
Mail bag catcher ..... J. T. Hindman
Mail bags along railway lines. Device for delivering ..... A F Martel
Mail carrier ..... A. & C. W. McIntire
Mangle roll covering ..... J. H Hunt
Marker Pie ..... C. Sullivan
Marking apparatus. Credit ..... J. J. Leidigh
Match making machine dipping device ..... P. Moreland et al
Measure. Tailor's tape ..... B. Ricciardi
Measuring and weighing machine ..... E. G. Staude
Measuring speed of rotation. Apparatus for .. W. D. Litchfield
Metal ware. Machine for scouring and scratch brushing flat ..... D. F. Broderick
Metallic powders. Preparing .. W. F. McNulty
Micrometer gage. Limit ..... L. C. Woerner
Micrometer screw gage ..... O. Eilhauer et al
Mining machine. Coal ..... W. Yeatts
Molding machine. Crayon .. C. E. Daniel et al
Money box ..... M. J. Ogden
Motor control ..... E. R. Carichoff
Motor control system ..... M. W. Day
Motor controller ..... W. Fiedler
Motor regulating device ..... W. C. Runge
Mower. Lawn ..... A. B. Case
Mowing machine ..... W. Oster
Music playing instrument. Autopneumatic ..... W. R. Crippen
Music playing instrument. Autopneumatic .. W. A. Watson
Musical instrument. Wind .. F. A. Buescher
Musical instruments. Mechanically controlled soloaccent device for mechanical ..... P. Wuest Jr
Musical players. Pneumatic motor for use in automatic ..... G. P. Brand
Necktie fastener ..... M. Balla et al
Nest. Trap ..... H. P. Rankin
Nut lock ..... E. A. Doty
Odometer ..... B. Schneider
Oil can ..... S. E. Friend
Open hearth furnace ..... T. S. Blair, Jr
Ore concentrating table ..... F. E. Shepard
Ore concentrators. Feed box for ..... W. L. & F. S. Card
Ore roaster ..... A. J. Garver
Ores. Cyanid treatment of ..... A Adair
Organ blowing apparatus ..... I. H. Spencer
Package feeding machine ..... L. M. Nielsen
Packaging machine ..... E. Stanley
Packing case ..... A. R. Speer
Packing. Metallic ..... W. H. Law
Packing. Stuffing box metallic ..... J. C. W. Weber
Padlock ..... A. F. Bardwell
Paper. Protecting commercial. E. E. Angell
Piano. Combined automatic and manually operated ..... M. Clark
Pick ..... J. Olson et al
Picture frame ..... H. Kassahn et al
Pin setter. Ruby ..... C. A. Sloan
Pipe coupling. Train ..... W. H. Myers et al
Pipe fitting ..... A. C. Walworth, Jr
Pipe seaming machine ..... C. H. Gervers
Plane ..... J. H. Shaw
Plaster slabs for building, &c. Making wooden cored ..... G S. Mayhew
Platen shif mechanism ..... G. W. Campbell
Plow harrow attachment ..... J C. Fooshe
Plow. Reversidle disk .... C. M. Mallory et al
Plow. Reversible disk ..... S. V. Weeks
Plow standard. Adjustable ... W. P. Wigley
Plows. Caster controller for wheeled ..... W. L. Paul
Pneumatic despatch tube apparatus ..... 2 pats ... C. F. Stoddard
Poke. Animal ..... G. R Mumford
Post driving machine ..... W. W. Turner
Pot lid ..... E. E. Spottswood
Poultry fountain ..... M. L. Weldon
Power transmitting device ..... E. Winans
Preserving and canning device .. S. W. Harrell
Pressing machine ..... J. Lehr
Printing mechanism ..... F. G. Jahn
Printing press ..... A. K. Taylor
Printing press inking fountain ... S. G Goss
Printing presses. Automatic ink font for platen ..... G. O Been et al
Printing presses and similar machines. Feed mechanism for ..... G. W. Pronty
Printing presses or the like. Detector for .... A. Obert
Protector for ears, forehead, and eyes ..... I. Seitzman
Pulley ..... J. L. Coleman
Pump ..... A. Papillon
Pump ..... T. Foy
Pump. Measuring ..... C. S. Jones
Pump. Measuring ..... F. C. Wilson
Pump. Pneumatic ..... D. L. Holden
Punching machine and feeding mechanism therefor ..... F. C. B. Page
Pyrometer ..... C. B. Thwing
Radiator ..... V. Lacing
Radiator ..... C. Wright
Railway brake mechanism. Inclined ..... 2 pats ..... S. E Jackman
Railway frog ..... T. F. Donahoe
Railway rail joint ..... T. B. Cheek
Railway safety device. Inclined ..... S. E. Jackman
Railway signal ..... C. W. S. Turner
Railway signaling ..... J. B. Struble

Railway signal. Electrically operated.....H. J. Jones
Railway system. Electric.....W. B. Potter
Railway tie .....M. J. Nolan
Railway tie and rail fastening.....G. W. Rittersbach
Railway train safety mechanism.....J. Doyle
Railway trains. Automatic apparatus for stopping moving.....J. T. Thompson
Railway trains. Controlling apparatus for.....J. T. Thompson
Razor blade holder. Safety.....W. N. Ward
Razor. Safety.....J. W. Leslie
Razor. Safety.....J. J. Steinharter
Receptacle .....L. J. Sheperd
Receptacle and closure therefor .C. C. Gibson
Receptacles. System for closing .....P. Lamouroux
Regulator .....R E. Atkinson
Relay .....L F. Howard
Relay for circuit breakers.....M. Fuss
Resistance unit.....C. Macmillan
Riprap .....F. W. Hawkes
Riveters. Traveling frame for side shell .....J. M. Sr., and J. M. Dobbie
Rock drill feed mechanism .....T. Turner
Rolling black plates and sheets. Apparatus for.....C. W. Bray
Rolling black plates or sheets .C. W. Bray
Rotary engine.....T. Veitch
Rotary engine .....L. C. Tippett et al
Rotary engine .....C. R. Francis
Rotary motor .....E. R. Mills, et al
Rubber. Artificial.....W. H. Brownlow
Rug turfing machine.....J. J. Baird
Rule or calipers.....G. W. Le Compte
Sack cleaning apparatus .....W. E. Mann
Saddle safety stirrup release .....H. Arndt
Safe .....J. M. Allen
Safe door support.....J. M. Allen
Safe lock .....J. M. Allen
Sandpapering machine .....J. Black
Sash balance and pulley casing.....C. H. Ocumpaugh
Sash fastener .....G. A Orr
Sash holder .....T. N. Jones
Saw .....W. B. Huther
Saw guard .....F. C. Pfeil
Sawmill feed.....R. L Woodruff
Saw mill. Gang.....W. M. Wilkin
Sawmill set works.....A. Cunningham
Saw. Portable crosscut.....A Schubert
Saw set .....J. M. Hancock
Scouring machine .....W. L. Jacobs
Screen .....J. L. Mallory
Screen handle fastener .....M. & C. Murray
Screen mechanism. Rotary....W. C. Matthias
Screw spanner.....J. F. G. Lund
Seal lock .....J. A. Wilkinson
Seat guard locking device .....S. E Jackman
Separator bowl. Centrifugal .....P. B. Shee
Sewage sludges. Treatment of .....F. M. & H. Spence et al
Sewing machine take up mechanism.....P. Anchutz
Shade and curtain bracket....M. S. McNeese
Shade bracket. Window.....C. I. Wimmer
Shaft oscillator. Mechanical...W. F. Bouche
Shaft support .....E. Nestler
Sharpening means. Disk.....W. S. Cline
Sheave block.....W. H. Corbett
Sheep shearing machine.....T. A. Martin
Shelving.....G. H. Hurteau
Shoe polishing machine.....F. Humphreville
Shoe tree and holder.....E. G. Latta
Shower bath .....C. Heaton
Shuttle .....E C. Ives
Sign. Electric .....W. Wallace
Signal apparatus .....C. W. Coleman
Signaling system .....E. E. Kleinschmidt
Signaling system. Wireless .....J. L. Jones
Siphon. Alternating.....R. C. De La Hunt
Slat operating mechanism.....B Albertson
Sled .....L. Therriault
Sling .....H. Ochrmann
Slot machine .....J, P. Munch
Solder feeding mechanism for canning machines.....N. Nelson
Solder for aluminium .....T. T. Hosack
Sole or heel. Shoe.....J H. Vinton
Sound amplifier.....N Baldwin
Spark plug.....A Holsten
Specnlum. Mouth.....J. F. Koehler
Speed changing mechanism for hydro-extractors .....H. Hott
Spinning or twisting frames for top rolls. Traveling guide for .....L. T. Houghton
Split switch.....G. M. Ervin
Spooler .....A. E. Roades
Spring roller.....J. H. Sweetland
Sputum cup.....H. J. Potter
Sputum cup .....C. W. Meinecke
Squares. Machine for rolling carpenters'.....H. K. Jones
Stable equipment .....J. Von der Kammer
Stair rod fastener .....W. H. Joyner
Stamped fabric.....C. E. Bentley
Stay log .....E F. Smith
Steam conduit .....J. W. Aylsworth et al
Steam generater .....H. Cox
Steam generators. Automatic stoker for .....J. Hodgkinson
Stereotype plate holder.....J. S. Weyl
Stoker. Mechanical .....D. A. Wood
Stool or seat. Adjustable.....W. C. Hahne
Stoves, &c. Auxiliary fuel box for .....T. B. Lockley
Strainer.....M. Hancock
Strap fastener.....G. A. Mains
Superheater .....2 pats.....M Toltz
Swaging mill.....E. Winter
Swing. Veranda.....W. F Till et al
Table game attachment.....C. J. Knudson
Talking machine stop mechanism.....J. C. Stuckey
Tanning compound .....H. M. Murray
Telegraph pole, fence post, and the like .....H. Miller
Telegraph. Printing.....B. W. Cochran
Telegraphy. Wireless .....W S. Hogg
Telephone lines. Measured service system for .....2 pats.....J. L. McQuarrle
Telephone receivers. Adjustable support for .....R. Higgins
Telescope.....L. Bell
Telescope. Sight.....F. Schieth
Thermal protectors. Automatic resetting and testing means for .....F. B Cook
Thill coupling.....A. F. Warele
Tile .....J. F. Schwartz
Tile .....H. Haugh
Timber framing machine .....J. Peters et al
Tongue switch .....E. Lewis
Tool chest handle .....H. Cowan
Tool. Combination.....A. Weber
Tool. Machine .....F. Muller
Tool or utensil. Combination.....J. R. Hamilton
Toothpick machine.....W. F. Hutchinson
Toy. Advertising .....J. Bauno
Toy badge .....J. J. Meehan
Train protecting device. Automatic.....E. Unverricht
Transformer. Steam .....S. Otis
Transmission device.....O. & H. Matthei
Trap .....L A. Cornelius
Trees. Grafting.....P. Keiser
Trolley .....S. D. Hunt
Trolley head for electric traction .....G. B. Holmes et al
Truck. Brick.....H J. Dundas
Truck. Motor railway.....S. Otis
Truck construction. Car.....O. S. Pulliam
Truck side frame. Car.....H. C. Buhoup
Truck wheel .....G. F. Armstrong, Jr
Tube cutter .....F. Fleming
Tubes. Manufecture of.....A. E Beck
Tubes. Mill for manufacture of....E. Winter
Tubes, &c. Mill for manufacture of.....E Winter
Tubulating machine .....J. T. Fagan
Tug. Hame .....A. E. Sutton
Tunnels. Ventilation of .....S. C. Davidson
Turbine Reversible elastic fluid..C. W. Dake
Typewriter machine .....D. Briggs
Typewriter mechanism .....J. B. Secor
Typewriters. Platen rotating mechanism for .....H J Otto
Typewriting machine.....H. W Merritt
Typewriting machine.....A. W. Buckweil
Typewriting machine indicator H. A Dewing
Valve .....W. M. Wheildon et al
Valve and by-bass. Hydraulic four way .....W J. Tretch
Valve connection. Tripple.....F. L. Clark
Valve Engine stop.....J. L. Kimball
Valve. Gate .....L. Schutte
Valve grinder.....P. F. Pilliner
Valve mechanism for air compressors.....F. Lafferty et al
Valve. Safety.....L. Schutte
Valve. Sensitive triple.....W. B Mann
Valve. Steam actuated .....G. W. Meyer
Vegetable topping machine....A E Vrooman
Vehicle body.....H. H. Porter Jr
Vehicle door.....J. Ludwig et al
Vehicle spring suspension..W. W, Macfarren
Vehicle top support.....T. Heney
Vehicles, Means for checking side slip of road .....W. E Monro
Vending apparatus.....A. Rosenfeld
Vending machine. Cigar .....A. Jacobs
Volatile substances. Purifying...J. U. Lloyd
Wagon box and stock and hay rack Combined .....O. K. Hibbets
Wagon. Dumping .....T. Wright
Warp stop motion.....B. F. McGuiness
Wash and bath tub and ironing table. Combined .....A Lombardo
Washer .....C. G. Ette
Water cooler .....I. T. Cole
Water measuring gate.....A. H Stokes
Water meter.....C. F. Merrill
Water meter .....N. W. Hartman
Water motor .....T. M Heister
Water motor wheel.....reissue B. B. Bush
Wheelbarrow wheel.....C. A. Baker et al
Wind power Machine for use with J Homola
Winding device .....S. W. Wardwell
Windmill regulator.....O. C Hoevet
Window cleaner.....B. A. Hill
Window construction.....R. E. Turnbull
Window screen.....H. Wright
Window screen.....A. A Day
Window tightener .....J M. Haddow
Wiping strip and making same..C. S. Clark
Wire and wood slats. Machine for weaving .....T. F. Hagerty
Wire stretcher.....G. H Weyant
Work bench. Portable .....H. Rosenbaum
Work locating indicator....T. L. Dennis et al
Wrapping machine.....J. M. Patterson
Wrench .....C. H. Myers
Wrench .....J. F. Large
Wrench .....A. L. Shears
Wrench .....E. H. Vanderslice
Wrench .....A. S. Pearce
Zinc skimmings, Utilizing.....T. Breen

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Abrasive wheel.....R. Gardner
Addressing machine.....S. C Cox
Adjustable bracket.....C. F. Kade
Advertising device.....C. C Bonnert
Aerating and bottling apparatus G. Higginson
Air brake apparatus and method Automatic .....J. T. McIntosh et al
Air brake safety device.....J. W. Guffey
Air. Compressing and purifying. W. O. Felt
Air conveyer. Fresh .....K Anthony
Air inspirator.....J. Heimlich
Air ship attachment.....A. Mathews
Alcohol burner.....H. P. Glazier
Amusement apparatus.....H. F Maynes
Amusement device.....J. W. Bourke
Animal trap .....F. Rasmussen
Applauding device and the like .....F. M. Duckworth
Apple trimming machine.....W. Smith
Apron guide .....F. G. Sargent
Automobile alarm.....J. K. Stewart
Automobile driving mechanism...E. O. Sutton
Automobile mergency brake ...H. F. Dietz
Automobile engine cooling system .....J. N. Emley
Automobile rack .....J. A. Mason
Automobile spring suspension E. J. Jenness
Automatic steering mechanism.....S. P. Thompson et al
Automobile wheel. Spring cushioned .....W. A. Hill
Awning .....J. C. Williams
Axle. Double cone ball bearing C. Dackiewicz
Bag rack .....G. H. Tenney
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Baling press .....F. Bowen
Ball distributer.....A. Kowastch et al
Balloon. Captive .....H. A. Herve
Barometer. Aneroid.....A. E. Kahn
Barrel cleaner .....L. Lange
Bath tub attachment.....W. C. De Camps
Bathing and massaging machine. Portable rotary.....C. F. Paupel
Bearing. Center .....W. Townsend
Bed .....H Kintz
Bed Infant's.....J. Gamber et al
Bed Sofa.....W. Reddell
Bee gum.....W. E. Caperton
Beer pipe cleaner.....C. H. Richardson, Jr
Bell. Signal.....G. F Drew
Belt and belting.....D. Nettenstrom
Belt Conveyer.....G. C. Plummer
Belt guide.....H. Gross
Beveling machine.....C. E. Lingenfelter
Boards. Machine for uniting matched.....A. Mereen et al
Boiler fire box. Locomotive.....2 pats .....J. M. McClellon
Boiler furnace. Steam .....W. J Ellis
Boiler furnace. Steam.....A. K Young
Book. Combined warehouse invoice and freight .....S. M Rich
Boot. Felt.....J. P. Kline
Bottle closure .....P. Doersch
Bottle closure .....J. S. Hawkins
Bottle closure.....A. Morehouse
Bottle Non refillable.....C. A. Parker
Bottle. Non refillable .....A. Wicke
Box .....F. E. Ward
Box and closure thereof .....P Mettmann
Box cover lifter. Sheet metal .L. F. Hirsh
Box fastener.....F. S. Johnson
Box strapping. Apparatus for making .....E. S. Norton
Bracelet band.....2 pats.....T. S. Bennett
Brake beam .....C. A. Lindstrom
Branning machine.....J. W. Bryson
Bread slicer.....H. Frank
Brick mold washing machine..J W. Goulding
Broiler.....G. J. Miller
Broiling apparatus .....G. J. Miller
Broom corn fiber sorting and sizing machine.....R. D. Gallagher, Sr
Brush. Fountain shaving.....I D. Stevens
Brush. Shaving .....W. J Roche
Bucket. Self dumping.....B. A. Faus
Buckle.....A. Kallberg et al
Buckle. Cross line.....O H. McBride
Building foundations. Drainage for.....E. C. Hodges
Bundler and binder .....W. D. Harrell et al
Burglar alarm.....B. Uhlmann
Bust reducer and supporter.....O. D Cornell
Butter. Manufacture of.....A. H. Borgstrom
Butter measure and cutter.....D. F. Curtis
Button. Collar.....S. M. Brydges
Button Laundry .....J. S. Barnes
Butts and hinges. Machine for making .....W. S. Trask
Cab window .....J. D. Lane
Cabinet Grocery.....W. J. Perritt
Cable attachment.....F. R. Wilison, Jr
Cable clamp .....A H. Meech
Cable suspension device.....M C. Williams
Calculating machine.....W. M. Boehm
Calk .....A. Distler
Canning and washing apparatus H. D Chance
Car construction.....I. L. Kiser et al
Car door.....T A Corsen
Car door and step operating mechanism.....H. Rowntree
Car door closure .....J. M. Lugar
Car door. Railway.....O. Tower
Car gate. Railway.....N. Grasso
Car handle.....G Robbins
Car loader.....W. S. Mayers
Car loader .....J. H. Huhn
Car loader .....J. H. Huhn et al
Car. Motor operate dumping.....reissue.....C. P. Astrom
Car mover .....A. J Maine
Car. Railway.....F. E Thompson
Car seat. Reversible.....E. P Rideout
Car stake.....J. D Perry
Car steel underframing. Railway F. L. Irwin
Car step .....O. A. Kneeland
Car underframe.....H. C. Priebe
Carbon tetrachlorid. Producing F. J. Maywaid
Carbureter .....G. M. Schebler
Card teeth. Apparatus for hardening and tempering.....A. G. Herman
Carding machine under screen R. M. Whitney
Cash indicator .....J. Pfeifer
Chain. Sprocket.....C Livingston
Chains Machine for automatically making soldered cable and globular or pea-shaped.....L. Bruckmann
Chart. Elbow.....E. Palm
Check operated mechanism .....E. A. Beaumont, Jr , et al
Chuck.....2 pats.....V. J. Wahlstrom
Churn.....W. E. Borden
Churn.....J. W. Connett
Churn operating mechanism.....G. E. Smith
Chute frame .....J. M Triggs
Circuit closer.....T. M. Foote
Clamp .....D. J. Cyr
Clothes line reel .....R. Murchison
Clothes line reel.....F. Shaffer
Clothes pin.....E J. Conrad
Clothes pin .....J. W. Lewis
Clutch .....V. J. Wahlstrom
Clutch .....W. R. Warren
Clutch. Electric.....N. S Harter
Clutch mechanism.....J. Hartness
Clutch mechanism .....C. T. Painter
Coal drill .....B. V. Gilmore
Coal handling apparatus.....J. M McClellon
Coat and hat rack.....G. W. Chubb
Coin counting, registering, and bagging machine .....C. S. Batdorf
Composition of matter.....M. Ams
Computing machine .....A. W. Krahn
Concrete block machine.....C. Wolfenden
Concrete structure reinforcing bar, ...A. Priddle
Condenser. Steam.....G. W. Pendleton
Connecting device.....G. A. Schnaufer et al
Conveying machine .....P. A. Robbins
Cooking utensil .....M. Harloe
Core. Collapsible.....J. A. Walker
Corn grader.....C. Hunnicutt
Cotton chopper .....J. Hudson
Cotton pickers' bags. Guard for .....B. C. Penington
Crank shaft.....T. J Farrell et al
Crate. Knockdown.....W A. Perkins
Cream separator.....H. J Lawrence
Cruller cutting machine .....T. C. Patterson
Crutch .....A. D. Wick
Cue clutch .....J. J. Callaghan
Curtain raising device. Back.....T. H. Bauer
Cutlery sharpening macnine.....L. A. Flinker et al
Cycle, motor car, &c , brake.....A. R. Turner
Cylinder motor. Revolving.....T. O'Brien
Damper .....H W. Neal
Damper. Time controlled.....S. B. Brown
Desk Portable.....J. Lipscond
Disk knife holder .....J. Brocks
Dispensing box wall section.....L Stowe
Display easel.....J. B. Timberlake
Display rack.....J. B. Timberlake
Display rack.....S. M Hulzet al
Door check.....H. W. Schiermeyer
Door check.....W. Bennett et al
Door lock mechanism.....I Johnson
Doors. Adjustable hinging strip for.....L. S. Prentiss
Dough elevating and handling up apparatus .....A. E. Aldred
Draft equalizer.....W. C. Campbell
Draft equalizer .....F. B. Stout
Draft releasing device.....E. L Burd
Drain system and apparatus.....J. F. Gross
Drawer. Furniture.....A. J. Throm
Drawing board .....H. L. Burbank et al
Dredge cutter head.....W. J. Knight et al
Drier .....A. C. Sargent
Dump table.....F. S Peck
Dust pan and broom holder. Combination.....C. H. Lyons
Ear ring.....F. E Farnham
Ear ring .....E F. Wilde
Eaves trough hanger .....W. Batdorff
Eaves trough screen.....J. D. Hagerer et al
Educational material.....A R Eliot
Electric compensator.....E. O. Schweitzer
Electric connector and switch. Combined.....S. F. Burbank
Electric furnace.....F. J. Tone
Electric machine. Dynamo .....D. C. Jackson
Electric machine. Dynamo.....M. Pfatischer
Electric machinery. Dynamo.....C. A. Parsons et al
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Electric switching apparatus and controlling apparatus therefor.....A. Blackmore
Electrical attachment for movable objects.....reissue.....J. R. Dawkins
Electrical distribution system.....2 pats....J. L. Woodbridge
Electrical protective apparatus. Automatic resoldering device for .....F. B Cook
Electrical thermostatic alarm.....J. Finch
Electromagnetic press.....J. P. Buckley
Elevated carrier.....P. A. Henning
Elevator safety appliance.....J. Coleman
Elevator safety appliance.....J. L. Boren
Engine.....C. H. Way
Engine .....C. W. McGonigle
Engines. Sparking plug for internal combustion .....A. E Lamkin
Envelop sealer.....H. Richissin
Envelops from fraudulent or unauthorized opening.....W. Myers
Evaporator.....E. Zaremba
Exercising apparatus.....F. Marsland
Extension table.....A. C Long
Eyeglass mounting.....I. Boltan
Eyeleting tool. Revolving....W. A. Bernard
Fare indicator .....B. Schneider
Faucet. Combined hot and cold water.....A. Johnson
Feed water heater.....C Stickle
Feed water heater and purifier....W. H. Berry
Feeding and tension mechanism B. W. Scott
Fence post.....J. H. Fitzgibbon
Fence post and line wire fastener therefor. Cement .....W. M. Gibbs
Fence post. Steel.....J. P. Lavoie
File. Bill.....A. Morehouse
Filter. Feed water.....O. L Stump et al
Fire alarm.....R. M. Whipple
Fire escape.....F. J. Bryant
Fire extinguisher.....S. O. Stanley
Firearm sight. Telescope 2 pats F. F. Burton
Firearm sight. Telescope.....F. F. Burton
Fish decoy .....C M. Wilcox
Fish hook guard.....E. W. Hildreth
Fishing reel.....C Ubrich
Flood gate.....S. C Smith
Fly trap shed.....W. H. Harbuck
Folding chair .....W H. Thomas
Folding machine .....E H. Brown
Foundry apparatus... ...G. B. & J. A. Hayes
Fruit juice extractor.....O. Persen
Fuel feeding device.....G. W. Gardiner
Furnace.....H Strand
Furnace burner. Hot air....J. Edwards et al
Furnace regulator.....W. L. Hager
Fuse holder .....R. O. Grooms
Galvanometer. Contact.....J. W Manley
Game apparatus.....C. E. I. Lundberg
Game apparatus. Racing..G. F. W. Schultze
Garment marking device.....A. E. Wise
Gas burner.....L. R. Yansky
Gas engine.....E. J. Stoddard
Gas engine.....A. R., & F. S. Welch
Gas engine.....D. Libby, Jr
Gas governor.....A. Scheck et al
Gas machine. Acetylene.....L. H. Miller
Gas mantle .....P. R. Finch
Gas producer .....G. W. Bulley
Gasolene or other oils. Measuring apparatus for.....J. F. Barker
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Gate operating mechanism.....G. Haas
Gear. Driving.....I. B. Rahn
Gear. Reversing .....C. W. Sponsel
Gear. Transmission.....E. Koeb
Gear wheel.....J. J. Jones
Gearing.....J. W. Leonard et al
Gearing. Power transmission.....G. Milner
Gearing. Transmission.....E. B. Kent
Glass. Apparatus for delivering molten.....R. S. Pease
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Grafting tool.....J. M. Haley
Grain scourer. Rotary.....S T. Wilson
Graver sharpener.....R. L. Hight
Grease cup .....W. W. Crosby
Grindstone sickle support.....W. C. Rarig

Gun. Breech loading.....A. Fyrberg
Gun muzzle attachment. Automatic .....A T. Dawson et al
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Hammer drill.....A. E Johnson
Harrow.....E. Etheridge
Harrow riding attachment.....L. A. Brenizer
Harvester. Corn.....J. Nixon
Harvester. Cotton.....E. M. Williams
Harvesting apparatus. Cotton.....S. A. Ellis
Hat, bonnet, &c, fastener.....J Fenton
Hat ventilator.....A. L. Eliel
Hay press.....J. W. Wirtz et al
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Head rest.....N. J. Johnson
Heat engine.....F, X Govers
Heating or refrigerating apparatus.....H, Naranjo
High and low water alarm.....S. E. Jarvis
Hinge. Gate.....L A. Holden
Hoisting apparatus.....C. T. Painter
Honey section. Comb.....W. J. Lewis
Hopper. Feed.....G. E. Snyder
Horn. Electrical.....W. E. Russell
Horn support. Amplifying.....F. L. Bedell
Hulling machine.....L. Lash
Humidifying apparatus.....A. W. Thompson
Hydraulic motor.....W. F. Mottier
Hydrogen peroxid. Producing.....R. Wolffenstein
Ice cream server.....W. R Cameron
Ice shaver.....W. A. Lupton
Insulating board or slab.....G. Kelly
Insulator.....D. M. Bass
Insulator. Wall.....F. N Locke
Internal combustion engine.....J. F. Duryea
Jar closure.....D. Knowlton
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Key filing device.....J. D. Bowne
Key ring.....L. M. Morden
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Knitted fabric. Rib.....R. W Scott
Knitting machine. Warp.....H. Hill
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Labeling machine.....C. W. Kelly
Ladder. Metallic step.....H. Adler
Lamp, Electric arc.....G. M. Lane
Lamp. Incandescent.....H. Boehm
Lamp Therapeutic.....J. B. Wantz
Lamps. Automatic starting device for alternating current vapor.....C. H. Vom Baur
Lamps. Joint ring for acetylene gas.....C. W. Beck
Lamps. Manufacturing reflector incandescent.....H. Gilmore
Lasts. Turning.....W. E. Trufant
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Lifter.....F. H. Mayer
Lighting system safety cut-off, Storage.....R. E. Bruckner
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Line fastener.....A. Dyer
Linotype machine.....P. T. Dodge
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Liquids. Apparatus for automatic sale of.....E. W. Lindgren
Lister attachment.....R. C. Mills
Litter carrier.....M. G. Shumway
Lock.....W. E. Peeples
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Locomotives or motor cars. Multiple unit-controlling system for electric.....R. Wikander
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Looms. Cloth take up motion for.....W. H. Clegg
Mail matter. Machine for stamping and sealing.....L. J. Hall
Mandrel. Tube.....J. R. Harbeck
Manhole cover.....W. Egie
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Manifolding device.....B. E. McSheehy
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Mechanical movement.....W. E. Schneider
Metal ceiling construction.....M. E. Perry
Metal sawing machine.....C. A. Juengst
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Metallurgical furnace.....J. C. Cromwell
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Mop holder.....O. K. Brown
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Motor controller. Alternating current.....A. Sundh
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Mowing machine.....D. R. Griffiths
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Music roll spool.....J. W. Barnes
Music stand.....M. R. Hackerson
Musical instrument.....E. J. Elsas
Musical instrument.....W. A. Gay
Musical instrument.....C. Weiss
Mutoscope.....P. Frost
Nasal snare.....T. E. Duffee
Nut cutting tool.....J. J. Kerr
Oil burner.....S. B. Rappleye
Oil burner. Locomotive.....G E. Witt
Operating table.....B. D. Thorner
Ores. Round buddle for dressing..A. Demuth
Organ or the like within human bodies. Instrument for determining the position of an.....J. Gillet
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Pencil sharpener.....N. Stafford
Penholder.....W. W Thomas
Perforated strips. Apparatus for producing.....T. A. Edison
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Pipe and nut wrench.....A. C. May
Pipe coupling. Angle.....W. R. Sheckler
Pipe coupling packing.....A. W. Graham
Piston.....C. S McKee
Planter fertilizer attachment .C. W. Michael
Planter. Seed.....P. H. Higley
Plow.....J. Willig
Plow.....A. J. Amundson
Plow.....E. V. Posey
Plow.....J. H. Edwards
Plow and cultivator. Combined.....J. Schimanoski
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Porous and fibrous substances. Treating and degumming.....G. D. Burton
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Power transmission device. Variable speed.....D. M. Dearing
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Propeller wheel.....R. W. Shaw
Protector unit. Individual.....F B. Cook
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Pruning shears.....W. H. Gray
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Pulverizer.....B. I Turman
Pump.....P. A. Myers
Pump. Oil well.....G. F. Bell
Pump. Rotary.....J. J. O'Donnell
Pump. Rotary.....G Okamoto
Punching and stitching tool ... S. E. S. Clark
Radiators. Automatic relief device for steam.....T. F. Dexter
Rail bond making apparatus.....A. B. Herrick
Railway.....M. S Ellis
Railway cattle guard.....F. Sack et al
Railway crossing.....A. Hosmer
Railway electric signaling system.....H. J. Warthen
Railway electrical signaling system.....H. L. Rider
Railway joint.....M. Drake
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Railway signal and safety appliance.....C. J. Kintner
Railway signaling device.....G. S. Getchell
Railway tie. Composite.....J. Smith
Railway track construction.....H. B. A. Keiser
Railway vestibule diaphram.....H. H. Schroyer
Rake.....W. Cronk
Ratan splitting machine.....D. C. Hull
Razor blade holder.....S, Frazier
Razor stropping mechanism.....H. J. Gaisman
Razors. Holder for use in sharpening blades of safety.....N. A. Welles
Relay. Track.....J. D. Taylor
Renovator. Pneumatic.....J. S. Thurman
Resistance adjusting device H. P. MacLagan
Rock drill. Hydraulic.....G. E. Gjnke
Roller coaster. Horizontal.....B. A. Karr
Rolling mill hydraulic counterbalance.....A. K. Hamilton et al
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Rotary engine.....K. H. Korhonen
Rotary engine.....A. W. Henkel
Rotary engine.....H. A. Hewey
Rotary shovel for loading cars.....J. H. Huhn et al
Rubber and fiber. Producing compounds containing.....F. M. Ekert
Rubber overshoe.....H C Mason
Sad iron cleaner and waxer.....J. Hornung
Saddle. Top roll.....E. Dixon
Safe and vault door boltwork mechanism.....E. A. Strauss
Sand box.....C. G, Hensley
Sand box.....J. L. Levy
Sash operating, locking, and balancing mechanism.....J. D. Hess
Saw attachment.....F. Tupper
Saw. Drag.....B. W. Scott
Saw set.....J. H. Keeter
Scissors.....A. Westerdahl
Scissors.....J. Feinenburg
Scraper. Road.....C. H. Lyons
Screw.....J. Sternamen, Jr
Screw cutting machine.....R. McCarty
Screw driver.....L. B. Hopkins
Screw machine.....J. English
Screw machine threading mechanism.....C. M. Spencer
Scrubbing.....P. H. Apple
Scrubbing machine.....T. McCabe et al
Sectional stand.....F G. Grimler
Seeding device.....W. G. Bolus
Separator for powdered material.....J. F. Pool
Settee bed and conch.....J. Phillipson
Sewers and the like. Form for.....G. G. F. Boswell
Sewing machine attachment.....J. H. Boye
Sewing machine attachment for felling, blind-stitching, &c.....G. J. Stevens
Sewing machine. Lock stitch.....H. H. Cummings
Shade and curtain bracket. Combined.....E. Dunkerley, Jr
Shade cord attachment. Window.....E. F. Hartshorn
Shade hanger level.....E. F. Hartshorn
Shade roller.....E. F. Hartshorn
Shaft support. Vehicle.....C D White
Sheet metal. Manufacturing.....A. Ridd
Sheet metal stamping die.....D. R. Levin
Shifting spanner or wrench.....F. Hartridge et al
Shirt waist retaining belt.....E. J. Montigny
Shock absorber.....W. E. Slater
Shoe creaser.....G. H. Wilkins
Shoe form.....H. A Weeks
Shoe case.....E. S. Bedford
Show case.....O. E Pierce
Shuttle.....J. A. Gallagher
Signal operating device. Train ...A. L. Wood
Signaling apparatus. Electric...F. B. Herzog
Signaling device. Headlight.....F Wessel
Signaling mechanism. Electric...J. F. Webb
Skiving machine.....G. W. Fairbank
Sled.....L J. Collins
Sled brake.....J. D. Hare
Smoke separator.....R. H. Weber et al
Solutions. Recovering.....W. A. Hendryx
Sound reproducing machine stylus.....S. Levin
Speed device. Selective.....E. Richter
Speed governor.....W. J. D. Miller
Speed indicator.....C. W. Sponsel
Spike and bolt extracting implement.....S. F Eubank
Spinning machine automatic chain-drive-regulating device.....J. M. Bain
Spool attachment.....W. I. Staaf
Spraying apparatus.....D. F. Prevost
Spraying machine. Plant....F. Batemanet al
Spraying purposes and the like. Mixer for.....W. C. Brown
Squares. Attachment for T.....G. A. Leonard
Stamp.....T. S. Buck
Staple forming machine.....W. G. Liebig
Steam engine.....J. D. MacLachlan
Steam table.....G. Goldman
Stone and concrete, Making artificial.....F. S. Lamson
Storage battery.....J. C Cook et al
Stove.....W. Andrew
Stove. Gas.....M. C. McVitty
Strap fastener.....M. Herzog
Streams. Regulating means for impact.....G. J. Henry, Jr
Stringed instruments. Hitch pin for.....J. R. Green
Stropping machine.....A. W. Peterson
Stuffing box.....A. H. Alberger
Surveying and range finding apparatus.....D. W. McLean
Switch and signal apparatus free from snow and ice. Means for keeping.....F. G. Shaw
Table leg blanks. Centering device for.....H. M. Funk
Tappet.....H. Hahn
Telephone. Intercommunicating.....W. W. Henry
Telephone supporting apparatus.....W. B. Lehmkuhl
Thread gage.....B. M. W. Hanson
Threshing machine sieve....W. F. MacGregor
Throat protector.....C. E. Winks
Ticket holder.....C B. Livermore
Time recorder.....D. A Stowell et al
Tire bench.....G. M. Lease
Tire for vehicle wheels, Elastic.....G. E. N. I. E. Subra
Tire. Pneumatic.....H. A. Palmer
Tire. Vehicle.....A. W. Butler
Tool.....S. A. Campbell
Tool.....R. Abell
Tool. Pneumatic.....O. W. Thomas
Toothpick boxing machine.....S. S. & W. W. Tainter et al
Torpedo placer.....F. James
Torpedo placing machine.....H. W. Simcoe
Towers. Base for skeleton.....D. R. Scholes
Toy.....P. A. Webb
Toy.....G. R. Floyd
Toy air ship.....W. J. Remaly
Track drill. Ball-bearing.....C. E. Nelson
Traction attachment for moving objects.....G. G. Schroeder
Traction wheel.....A. E. Glascock
Train controlling apparatus.....W. Germiner
Trigger mechanism. Single.....A. Raus
Trolley locking mechanism.....E. Y. Moore
Trolley wheel.....C. P. & H. C. Bostain
Trolley wire switch.....F. M. Zimmerman
Trousers guard.....M. M. Stearling
Truck.....S E. Mercer
Truck. Casket.....F. P. Sparmaker
Truck. Rail traversing.....E. E. Arnold
Trunk attachment.....G. H. Wheary
Truss.....F. C. D. McKay
Tube cutter and expander.....W. C. Wood
Tubing. Making seamless.. J. H. Nicholson
Tubular structural member.. H. C. Gammeter
Turbine.....R. H. Goldsborough
Typewriter.....E. J. Barker
Typewriter ribbon feed mechanism.....W. A. McCool
Typewriting and analogous machines. Cap for keys of.....E. D. Conklin
Typewriting machine.....C. A. Thistlethwaite
Typewriting machine.....P E. Rees
Typewriting machine.....A. W. Smith
Universal joint.....A. I. Jacobs
Valve.....A H. Bostley
Valve.....P. W. Marett
Valve. Balanced.....J. H. Woodring
Valve. Blow off.....L. A. Bertram
Valve. Gas engine admission.. G. B. Petsche
Valve. Hydraulic.....D. L. Holden
Valve seats. Machine for grinding locomotive.....J. A. Chadwick
Valve setting device. Engine.....R. E. Stephenson
Valve. Steam actuated.....D. W. Starrett
Valve. Stop and waste.....L. C. Lewis
Vapor generation and power system.....F. X. Govers
Vault mold. Burial.....J. M. Pruett et al
Vehicle belt shifter. Motor.....C. H. Dent
Vehicle brake.....J. N. Mahoney
Vehicle brake. Power driven.....J. N. Mahoney
Vehicle construction.....C. J. Harris
Vehicle coupling.....J. W. Impecoven
Vehicle. Motor.....G. P. Parks
Vehicle running gear. Motor.....D. M. Dearing
Vehicle storm front.....F. C. Brock et al
Vehicle wrench. Axle nut.....E. F. Hayes
Veil. Automobile.....D. Duncan
Vending machine.....L. Pinner
Vending machine.....J. J. Roman et al
Veneer. Artificial.....C. Tangenberg
Ventilator operating mechanism.....A. Q. Wolf
Vibrations. Apparatus for the production of.....J. Astrom
Vise.....E. G. Seymour
Wagon. Dumping.....J. M. Ripple
Wagons and the like. Draft apparatus for.....W. F. MacGregor et al
Washboiler attachment.....H. Hempel
Washing apparatus.....R. T. Haines et al
Washing machine.....G. Siewert
Washing machine.....J. H. Donb
Washstand. Portable folding.... J. C. Knapp
Watch and clock dial.....J. Strang
Watch. Stem winding and setting...E. Kuhn
Water closet.....E. G. Watrous
Water closet connection.....3 pats.....J. J. Cosgrove
Water closet lid and device for preventing seats from splitting and warping.....J. E Albright
Water feed regulator.....T. G. Rahestraw
Water gage.....H R. Fay
Water heater.....J. M. White et al
Water motor.....L. C. Lewis
Water motor.....E. T. Campbell et al
Water tank.....C. Willms
Water wheel nozzles. Regulating means for.....G. J. Henry, et al
Wax extractor.....O. L. Hershiser
Weaner. Calf.....G. M. Krauss
Weighing coal, grain, &c. Meter for.....M. Washburn et al
Weighing device.....R. E. Kimble
Well tube strainer.....G. H. Shoemaker
Wheel.....S. E. Mercer
Wheel fender.....T. J. Wilson
Wheel shovel.....C. T. Hookway
Whiffletree hook.....M. J. Corcoran
Whip socket lock.....J. W. Pope
Window cleaner.....F. S. & L. Thomas
Window frame pockets. Lock for closures of.....C. F. Smith
Window screen. Rolling.....B. Steinman
Wire barbing machine.....P. W. & J. W. Sommer
Wire coiling machine....2 pats.....R. L. Horsley
Wire support and insulator. Conducting.....H. W. Wistner
Wrapping machine.....S. E. Farnham
Wrench.....T, G. & A. P. Harryman
Wrench.....B. R. Ward
Writing a plurality of signatures or inscriptions simultaneously. Means for.....W. R. Woodward
Yarn sizing and similar machines. Measuring and marking motion for use in connection with.....W. H. Clegg

DESIGNS.

Chafing dish stands. Leg for.....E. A Gutermann
Chair.....H. Grossman
Dish or similar articles. Covered.....A. J. Meakin
Domino.....G. J. Thomas
Fabric. Textile.....A. M. Rapp
Fabric. Textile.....A. M. Rose
Lavatory.....H. Podmore
Plate.....3 pats.....E. E. Walter

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Account register.....A. F. Staples et al
Addressing machines. Type carrying belt for.....F. A. Harrison
Advertising device.....R. Wightman
Aeral machine.....B Connolly
Alarm box attachment.....L. G. Holden
Amalgamator.....G. E. Paullins
Annealing box.....J. B. Henry
Anti rail spreading device and gage.....Z. I, Pierce
Antisiphon trap.....J. C. Lauth
Apple box press.....J. McCanghan
Arch supporter.....C. L. Austin, Jr
Automobile attachment.....Z. G. Sholes
Automobile roadway.....L. S. Hackney
Automobiles. Means to record the speed of.....W. A. Cheesebro
Axle box cellar.....F. B. Harrison
Axle lubricator.....A. B. Day
Axle wheel coupling.....J. H. Snuggs
Bag holder.....W. M. Renne
Bait. Artificial.....W. E. Davis
Bank. Portable.....J. B. Poore
Barium oxid. Producing porous...H. Schulze
Barrel follower.....C. Kuheim
Base board.....A. M. Bryan
Bath apparatus.....J. B. Stockton
Baths, &c. Head for shower.....W. Attlesey
Beam. Reinforced steel.....E. Swensson
Bearing.....F. W. Schoenberger
Bearing. Shaft.....F. T. Zimmerman
Bed.....G. W. Bent
Bed canopy.....C. D. Brumley
Bed pan.....C. W. Meinecke et al
Beer tapper.....R, B. Spikes
Beeswax separator and purifier..G. B. Savage
Belt clamping tool.....B. T. Fritts
Bicycle. Motor.....F. P. Lindley
Binder. Temporary.....L. M. Morden
Blind, Awning.....G. W. Pearson
Boat.....C. H. Myers
Boat. Life.....R, A. Brown
Bobbin holder.....J. Pearson
Bobbins. Apparatus for applying expansible rings to.....F. C. Hodgman et al
Boiler cleaner.....I. C. Gray
Boiler cleaner. Steam engine.....I. C. Gray
Boiler tube scarfing machine.....C. H. Meyers et al
Boiling and distilling apparatus.. R. Planckh
Bolt lock.....O. Cullman
Book handle.....R Hinckley
Book. Painting.....R. H. Garman
Bookcase and folding bed. Combined.....W. Freedmann
Boot cleaner.....A. C. Houghton
Boot or shoe.....F. W. Homan
Boring bar.....W. Chase, Jr
Bottle.....D. J. Higginbotham
Bottle attachment. Non-refilling.....E. J. Clayton
Bottle stopper.....J. A. Moller, Jr
Bottle washing machine.....P. D. Laible
Box filling machine.....A. L. F. Mitchell
Braiding machine.....F. Thun
Brake block.....W. O. Blair et al
Brake operating mechanism..G. C. Wartman
Bread cutter.....F. J. Hassell et al
Broom.....W. Fanckboner
Bucket and operating mechanism. Grab.....H. P. Andresen
Bucket. Combined feed and water.....J. F. Alexander
Burglar alarm.....H. R. Lassen
Button.....I. Kalliwoda
Button.....E. Shantz

Buttonhole-strip....L. S. Newcomb
Cabinet. Compositor's bracket-....F. J. Walker
Cabinet. Disappearing-table....W. H. Carroll
Cabinet. Ironer's....L. R. Trager
Camphene. Manufacture of....F. Koch
Candlestick-lubricator....E. L. Faul
Candlestick. Miner's....G. D. Neill
Cane-mill roll. Sugar-....H. W. Aitken et al
Car. Mine-....E. C. and F. L. Callahan
Car-mover....J. S. Mullenix
Car-roof....W. N. Garrett
Cars. Three-point contract-trolley timer for internal-combustion motor-....G. M. Hurley
Carpet-stretcher, 2 pats....I. Freed
Carriage handle. Adjustable and reversible baby-....J. J. McIntyre
Carriage-top-bow separator....A. H. Veazie
Cash-carrier. Cable, 2 pats....G. A. Amsden
Cash-register....H. S. Hallwood
Cash-register. Multiple-drawer ....H. S. Hallwood
Caster. Furniture-....C. F. Mosman
Casting-machines. Apparatus for holding and pouring metal into molds for..E. A. Custer
Cattle-treating apparatus....J. B. Eaton
Cement structures. Means for supporting reinforcing-rods for....A. Witte
Centrifugal machine....L. P. Dillsea
Chain....J. H. Weston
Chair and couch. Combined....J. M. Hamilton
Chair and garment-support. Combined....J. F. Fairbanks
Chair fan attachment. Rocking-....D. J. Stein
Chimney construction....W. C. Hays
Chimney-cowl....M. Ludwig
Christmas-tree support....J. Vogt
Chuck mechanism....A. Tindel
Cigarettes with in-foil or the like. Apparatus for wrapping....A. Godfrey
Circles. Instrument for use in determining the functions of....A. S. H. Hitchings
Circuit-closing device. Time-controlled....C. A. Palmgren et al
Clasp....R. Falter
Cleaning system. Vacuum..F. J. Matchette et al
Clock....F. R. Alford
Clock. Workman's....C. L. Goughnour
Closet-seat....F. H. Lindenberg
Closet-tank....F. H. Lindenberg
Clothes-line prop....F. M. White
Clothes-line stretcher....C. R. Fish
Clothes-pin....W. D. Watkins
Clutch....P. Daniel
Clutch. Friction-....A. Oskamp
Clutch. Mechanical....J. D. Taylor
Coal-handling device....E. E. Barrett
Coating disks and similar articles. Apparatus for....T. H. Macdonald et al
Coffee rethresher and polisher....E. C. Prieto
Collar. Dog-....G. Huff
Column. Reinforced steel....E. Sweensson
Combination instrument....C. Schneider
Communion-cup....O. V. L. Harbour
Composing-machine....L. Allen
Concrete-mixer....A. W. Ransome
Concrete structure. Reinforced....A. Rogers
Conduit-section. Apparatus for alining....J. T. Rice
Controller....F. W. Garrett
Controller....L. L. Tatum
Converter....R. Baggaley
Converters and furnaces. Means for increasing the air-blast of....R. Baggaley et al
Conveyer....C. Bradford
Cooking utensil....L. G. Fagersten
Cooling-bed and conveyer....J. A. Smitmans
Copper. Obtaining pure....L. Jumau
Copy-holder....H. E. Penney
Copying-press....E. Eulenstein
Cork-extractor....R. O. Toan
Corn-shelling machine....J. A. Wilkinson
Cotton-chopper....G. M. Head
Cover-closure....F. Bredel
Crutch....E. E. Hayden
Culinary utensil....H. F. Hall
Cultivating-tool....H. R. Hilton
Current generator. Alternating-....G. H. Cove
Current meter. Alternating-....R. C. Lanphier
Current motor. Alternating-, 2 pats....R. Lundell
Cutter-head setter....J. W. Winningham
Dam....W. L. Church
Dam....H. L. Coburn
Dams. Building....W. L. Church
Dental articulator....G. B. Snow
Dental-engine handpiece....J. F. Hardy
Dental-handpiece angle attachment....J. F. Hardy
Dentistry. Manufacture of a new material suitable for use in....O. Hoffmann
Derrick....J. S. Allen, Jr.
Desiccating apparatus. Air-drier for....E. W. Cooke
Die-stock....S. Jorgensen
Digester and cooker. Rotary...M. R. Kennedy
Display-easel....J. E. Twitchell
Display-rack, 2 pats....J. J. Karges
Ditching-machine....G. Warne
Door and frame therefor for opening and closing air-tight chambers....S. P. Stevenson. (Reissue.)
Door-controlling device....C. H. Ocumpaugh
Door-manipulator....F. Schmitz
Door-securer....W. E. Raines
Door-securer....E. R. Fuchs
Draft-equalizer....J. J. Ford et al
Drilling appliance....H. Tyldesley
Drinking-fount. Poultry....P. M. Wickstrum
Dust-arrester....H. Lechtenberg
Dust-preventer....B. F. Schirmer
Elastic wheel....R. M. A. Leps
Electric-circuit-controlling mechanism....T. T. Fogel
Electric fixture....H. R. Mitchell
Electric machines. Series shunt for dynamo-....H. C. Beekley
Electric-storing device. Automatic....J. W. Ringer
Electrochemical analysis. Apparatus for....G. A. Guess et al
Electrode....G. A. Guess et al
Electrode for galvanic elements. Carbon....W. Möllenbruck et al
Electrotherapeutic instrument....B. Y. Boyd
Electrothermal protector....F. B. Cook
Elevator-lock....F. W. Ruppman
Elevators. Floor-gate-actuating device for....E. O. Ungar
Engine....W. O. Duntley et al
Engine-lathe relieving mechanism....H. Baerbalck
Engine oil suction and collecting apparatus. Steam-....C. Orengo
Engine-starter....F. L. Orr
Engines. Electrical sparking device for explosive-....W. B. Hayden
Engines. Utilizing working fluid in jacketed....S. A. Reeve
Engines. Water-cooling apparatus for gas or gasoline....J. C. McLachlan
Envelop....J. Lord
Eraser. Pencil-....B. A. Payson
Excavator....J. P. Farrelly
Exhibiting device. Coin-....A. M. Huntington
Eyeglass-guard....A. W. Anthoine
Factory building....E. Weston
Feed-bag....J. M. Darrow
Feed-rack....J. S. Smith
Feeding device. Poultry-....F. W. Ruggles
Fence-post....G. I. Gargett
Fence tie. Wire-....G. R. Mills
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Fiber-separating machine....V. A. de Perini
File. Druggist prescription-....I. Hotaling et al
Filter....G. M. Kneuper
Filters. Cleaning....G. M. Kneuper
Fire-alarm system....C. W. McDaniel
Fire-escape....F. W. Harkins
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Firearm. Automatic....C. Freeman
Firearm-sight....E. W. Evans
Flash-light apparatus....W. M. Murphy
Floor-cleaning machine....F. A. Lewis
Floor-surfacer....C. W. Miles
Floor-surfacing machine....G. S. Mathews
Flue-cutter....G. Sorenson
Fluid-pressure brake....W. V. Turner
Fluid-pressure-controlling means....F. E. Kinsman
Flushing device....J. D. Eschopik et al
Fork and rake. Combination....R. T. Hazzard
Furnace....E. H. Schwartz
Furnaces. Fuel-retarding member for....G. L. Junge
Game apparatus....J. H. Adams
Garbage-receptacle....T. H. Johnston
Garment....E. E. Jenne
Garment-fastener....H. Dickinson
Garment-fastener....M. Boylan
Gas-burner....E. M. Loftus
Gas-controller. Automatic....J. C. Landes
Gas-engine....J. J. Hogan
Gas-generator....R. M. Bidelman
Gas generator. Oil-....A. J. Riskey
Gas-meter. Prepayment....B. G. Waggner
Gate....D. A. Vandevort
Gate....G. A. Colvin
Gate-post....D. E. Stetler
Gear. Transmission-....A. F. Colgren
Gearing....G. D. Wilson
Gearing. Variable-speed....E. P. Cowles
Glass gathering and pressing machine....T. C. Steimer
Glass gathering and shaping machine....W. E. Bock
Gluing-clamp....A. C. Benson
Governor. Explosive-engine....L. C. Jackson
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Gun-shells. Device for contracting and reloading....J. Ansell
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Harvester cleaning attachment...C. Amundson
Hat-box....W. Dod
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Heater....M. W. Hall
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Hose-detacher....J. R. McDaniill
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Hub. Double-lock....S. D. Latty
Hydraulic press....W. Astfalck
Ice-cream scraper....W. Ross
Impact and reaction motor....C. Comstock
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Key-ring....A. H. Merrill
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Knife....J. H. Henson
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Ladder. Folding step-....A. Dahl
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Lamp. Incandescent gas-....O. Wiederhold
Lamp. Incubator or brooder..P. M. Wickstrum
Lantern. Signal-....W. S. Hamm
Last for boots and shoes. Reinforced....W. D. Baker
Latch-guard. Shutter....T. L. Ross
Latch-keeper....E. W. Vest
Laundry-machine....R. C. Geekman
Lead. Manufacturing arsenic compound of....C. D. Vreeland
Life-saving suit....M. A. Tieck
Lifting-jack....W. M. Cox
Lifting-machine....C. Moller
Litter-carrier....E. B. Mann
Loading device. Wagon-....G. H. Hefta
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Locomotive....J. E. Friermood
Locomotive-tender....M. E. Petty
Logging-hook....A. Sprogis
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Loom heddle-frame....G. Brisson
Looms. Picker-staff for weaving-....A. Rossignol
Low-water alarm....W. Loudon
Looms. Shuttle-positioning means for filling-replenishing....J. Gabler
Mail-bag catching and delivering device....L. J. Evans
Mail-box....W. E. and G. Weston
Mail-pouch-catching device....H. W. Graff
Mail-pouch-delivery device....H. W. Graff
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Manure-carrier....J. C. Fitzgerald
Mash-tub stirrer....O. Selg
Match-striking device....L. W. Miner-Stevens
Mattress stretcher. Wire-....J. Erlandsen
Measure. Computing tape-....E. F. Holinger
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Motor-controller....L. L. Tatum
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Multogram record....A. Hoffman
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Musical instruments. Stop mechanism for self-playing....B. C. Peck
Net-making machine....H. T. Richmond
Nut and set-screw guard. Lock-controlled....K. E. and J. Ahlberg
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Oil burner. Crude-....A. D. Marcotte
Oil-can....S. R. Parks
Order-blank holder....P. W. Lyon
Ore-crushers. Crusher-head for gyratory....C. W. Guttzeit
Ores. Desulfurizing and reducing sulfid....E. Dedolph
Ores. Roasting sulfurous....A. Savelsberg
Oven. Baking-....C. E. Lyst
Oyster-dredges. Means for operating....W. C. Todd
Package. Shipping-....C. G. Watson
Packing and producing same. Wire-rope....B. Brazelle
Packing-case. Sheet-metal....A. T. Kruse
Packing. Piston-rod....A. C. Schaefer
Packing ring. Metal steam-....W. Baker
Padlock. Keyless....J. Kruse
Pail support. Milk-....E. A. Blue
Paper-bag machine....C. B. Stilwell
Paper-cutting-machine gage....G. Nelson
Paper-folding machine....C. L. Rice
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Paving-block....A. Kelley
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Pencil-holder....F. R. Welles
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Phonograph-horn. Foldable..J. C. Stocker et al
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Pick. Miner's....W. and E. E. Donaldson
Picker-stick attachment....H. E. Taplin
Pile-driver....F. Burge
Piling. Cap for sheet-...E. A. Bern. (Reissue.)
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Pipe-casting mold....E. A. Custer
Pipe-coupling....F. Haus
Pipe-sections together. Device for pulling....A. Claiborne
Pipe-wrench....G. Heckling
Pipes. Apparatus for casting metal....E. A. Custer
Pipes. Casting....E. A. Custer
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Planter. Potato-....W. W. Taverner et al
Planting machine. Root-....J. H. Shirley
Plating device....G. W. Clough
Plow....W. Sobey
Plow. Irrigating or ditching....M. Jackson
Plumb-bob....O. C. McQuaid
Pocket-knife and manincuring-tool. Combined....H. M. Willis
Potato digger and shaker....M. Hebting
Power-transmitter....F. de Coligny
Printing and developing dark cabinet....T. A. Welsh
Printing-bar, matrix-making, and type-setting machines. Composing mechanism for....E. V. Beals
Printing-drum....F. A. Whitmore
Printing film holder....S. W. Guest
Printing plate holder....C. F. Rockstroh
Printing press folding apparatus..H. P. Husby
Printing press. Plate-....W. P. Allen
Printing press rotary folding mechanism....H. P. Husby
Projection apparatus....E. Bausch
Propeller....J. Nielsen
Propeller....F. A. Douse
Propelling device. Boat-....W. Arnold
Pump....T. E. Moon
Pump power attachment. Spray-....J. Rodgers
Pumps compressors and the like. Valve for....H. Ackermann
Pumping water under hydraulic power. Means for....J. D. Hobbs
Puzzle....E. C. Macartney
Pyrographic burner....A. M. Williams
Railway curve sweeper and lubricator. Street-....D. P. Small
Railway signaling system. Electric....N. P. Fraser et al
Railway-switch....J. F. Reese et al
Railway system. Third-rail electric-....C. Kozesnik
Railway system. Underground....J. H. Farrar
Railway-tie. Metallic....J. C. Thompson
Railway-tie. Metallic....A. L. Moorhead
Razor....L. Heuser
Razor-blade holder....A. H. Fleming
Razor. Safety-....H. L. Henry et al
Razor. Safety-....L. Heuser
Razor. Safety-....I. N. Brigham
Reclining-chair....M. Anthony
Recorder....P. J. Darlington
Recording apparatus....H. B. Palmer
Refrigerating cars....C. C. Trowbridge
Refrigerator....J. A. Agrillo
Registering apparatus....S. K. Lowman
Rock-drill and other percussion toll..T. Warsop
Rotary combustion-engine....F. Burger
Rubber tip and means for securing it....H. Fuller
Saddletree....G. J. Theobald
Sash-fastener....J. C. O'Neill
Sausage-linking machine....A. F. Little
Saw. Drag-....D. F. Campbell
Saw-filing device....C. F. Hobson
Saw-holder....J. B. Hill
Scale chart. Computing-....G. M. Ludlow
Scale. Computing-....O. O. Ozias
Scale. Weighing-....B. F. Crary
Scarf-holder....C. W. Seidenspinner
Sealing-in machine....M. H. Branin
Seam-dampener....H. A. Twigg
Sewing-machine....F. H. Chilton
Shackle....W. G. Eggleton
Shade-roller....A. H. Fleming
Shade-roller attachment. Window-J. L. Harrison
Shade-roller bearing....W. D. Janes
Shaft connection. Drive-....C. Atkins
Shaft-hanger....H. C. Floyd
Shaft-oscillator....W. F. Bouché
Shafting-supporting means....E. Weston
Shoe-rack shoe-protector....F. L. Richardson
Shutter operator or worker....A. Del Valle
Signaling system. Electric....W. H. Gilman
Siphon-head....F. B. Lomax
Skee-stirrup....C. Nordlander
Smoke-consuming furnace....F. E. Kelly
Sodium sulfate and compounds of lead. Preparing....A. S. Ramage
Sodium sulfate. Making....J. D. Pennock
Soldering-iron. Electric....W. G. Hartwig
Sound-reproducing head....C. A. Smith
Speed apparatus. Change-....A. Sauer
Speed-indicator....E. C. Oliver
Speed-indicator and distance-recorder....R. Shipman
Spike....T. Booth
Spooling-machine....R. J. Emory
Spooling-machine....T. D. Ruth
Spring-wheel....D. Warner et al
Sprinkler....G. Buelna et al
Sprinkler-system attachment....J. McAlear
Square....C. M. Praul
Square. Carpenter's....M. C. Post
Squares. Attachment for carpenters'....M. S. Sober
Stack-cover. Portable....W. Kindt
Stair construction....E. E. Schachner
Stamp-affixing machine....S. C. Kindig
Steel. Manufacture of open-hearth..A. W. Allen
Steering mechanism....H. E. Norris
Stone-crusher....E. C. Hodges
Storage battery....H. E. R. Little
Storm-shield and buggy-top....A. L. Trabue
Stove....J. L. Reid
Stove. Cooking-....A. W. Walker
Stove. Heating-....E. W. Babcock
Street and station indicator....C. A. Myers
Street-flusher....G. H. Thebus
Stud, button, &c. Collar....J. Varet
Surveying instrument....C. L. Walker
Sweeping device....R. M. Baker
Switch-governor. Automatic....L. Colson et al
Talking-machine needle....F. D. Hall
Tapping-machine. Vertical....R. Scholz
Teeth. Instrument for introducing liquid medicament into....C. G. Myers
Telegraph-pole....F. H. Tidnam
Telephone-exchange, 2 pats....S. A. Norstrom
Telephone-exchange calling device....F. A. Lundquist
Telephone-exchange selecting device....F. A. Lundquist
Telephone system. Central-energy....F. W. Dunbar
Threshing-machine separating-grate....F. F. Landis
Tide or wave motor....H. P. Woodard
Tide or wave motor....J. Hutchings
Tire-armor....G. Powell
Tire-protector....R. Parker
Tire-shoe....G. Deutzeau
Tire traction attachment. Vehicle-....C. B. Woodworth
Tires. Detachable tread for pneumatic....C. B. Woodworth
Toaster or broiler....H. O. MacDougall
Tobacco-pipe....E. Vallance
Toggle-bolt....A. L. Ellis
Tongs. Gripping-, 2 pats....A. Christianson
Tool....G. H. Goodholm et al
Tool. Combination-....O. O. Frink et al
Tool. Fluid-pressure-operated...H. H. Vaughan
Train-operated mechanism or opening and closing doors....P. L. Roberston
Trellis....C. I. J. Barker
Trolley....C. A. Gouty
Trolley....W. P. Gisske
Trolley-harp....S. T. Simmons
Trolley-pole guide....L. A. Allen
Truck....C. H. Loew
Truck. Car-....W. E. Amberg
Truck. Car-....C. S. Shallenberger
Trunk-tray form....W. S. Gilson
Turbine....W. Löh
Turn-table....J. C. Fleming
Type-setting machine....E. Terrell
Type-writer....E. D. Brewer
Unloading and depositing device. Automatic..C. von Bechtolsheim
Valve. Automatic flushing-....E. G. Watrous
Valve. Gate-....C. A. Claflin
Vamp-folding machine....G. F. Dunn
Vehicle-brake....D. Cookingham
Vehicle control system....N. W. Storer
Vehicle-heater....J. A. Shutz, et al
Vehicle spring-gear....J. L. B. Shepard
Vehicle-top-bow fastening....Z. G. Sholes
Velocipede seat-post....M. Rosen
Vessel-handle. Loose....L. A. Peterson
Veterinary operating-table....F. G. Atwood
Violin-piano....J. L. Warner
Wagon-box and hay-rack remover....E. Jose
Wagon. Dump-....D. S. Watson, et al
Wagon. Dumping-....A. Cameron
Wagon. Dumping-....R. N. Lowry
Wagon-elevator....E. H. Overholt
Wagon-seat....O. E. Pasko

Walls. Method and apparatus for making.....W. D. Ham
Warp stop-motion.....E. A. Thissell
Washboard. Self-soaping.....J. Koontz
Washboiler.....J. Mohr
Washboiler.....J. H. Brownlee
Water-closet.....P. H. Moohan
Water-columns. Means for maintaing flow in..C. Prött
Water heater and purifier.....J. E. Wood
Water-heater. Electric.....E. Naumer
Water-motor.....P. T. Coffield. (Reissue.)
Water-register. Automatic.....H. L. and H. K. Fairall et al
Water-return system. Drip-..W. H. Zimmerman
Water-tower.....W. H. Shafer
Water-wheel.....F. E. Renick
Weaving.....W. Hannah
Weighing device.....G. G. Kanable
Weighing-machine.....G. H. Mallett
Weir and tide gage.....L. C. Eisenhut
Well appliance. Oil-.....B. Brazelle
Well-drilling machine.....G. W. Doss
Well-drilling machine.....N. D. Wells
Wheel.....C. Adams-Randall
Wheel and tire gage. Combination.....J. E. Osmer
Wind-motor.....J. W. Beates
Wire-stretcher.....W. A. Vanderwilt
Doven fabric.....W. M. Stevenson
Wrench.....G. B. Chispin et al
Wrench.....E. A. Johnson

DESIGNS.

Bag. Hand-.....H. Grossman
Mirrors, brushes, or similar articles. Back for.....H. Hillbom
Spoon, fork, or similar article...F. Habensack
Spoons, forks, or similar articles. Handle for..C. Osborne
Vehicle-body, 3 designs.....C. Cretors

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Addressing-machine.....C. A. Belknap
Air brake. Compressed-.....F. Jordan
Air-brake-system safety attachment.C. E. Lyter
Air-compressor. Turbine.....E. C. Pollard
Air-purifier.....F. A. Ward
Air-ship.....A. C. Ellsworth
Air-ship.....G. W. Lane
Amusement apparatus.....T. Van Kannel
Amusement device.....W. J. Millican
Anthrachrysone derivatives...B. Homolka et al
Apparel.....R. B. Melanson et al
Atomizer.....W. J. English
Automatic alarm.....G. Rossi
Automatic gate.....W. S. Poindexter
Automatic sprinkler.....C. E. Buell
Axle. Pit-car.....J. E. Smith
Bag and fastening.....T. L. Beam
Band-cutter and feeder.....G. W. Tice
Banjo attachment.....E. J. Babbitt
Bark-peeling machine.....J. J. Russell et al
Barrel attachment.....J. H. Rothrock
Bath-tub shower attachment.....F. E. Ball
Battery-assembling apparatus. Storage-.....L. H. Flanders
Beans, &c. Machine for trimming string-.....W. B. Phinney
Bearing. Antifriction lateral-motion center...J. C. Barber
Bearing. Roller-, 2 pats.....J. Jacob
Bed and couch. Combined, 2 pats..D. T. Owen
Bed. Folding.....R. L. Herman
Bell. Electric.....H. J. Heeney
Blower, Jet-.....A. Cotton
Blowing apparatus. Jet.....A. Cotton
Boiler.....M. T. Goss
Boiler air-draft system. Steam-.....W. C. Wallace
Bone-cutting machine.....W. M. Conner
Book-clip and leaf-support.....W. C. Nash
Book. Memorandum-.....M. J. Wade
Book-rest and the like.A. Englefield. (Reissue.)
Bottle.....J. C. Reeves
Bottle-closure.....C. R. Schmidt
Bottle holder. Nursing-.....J. E. Pettee
Bottle. Non-refillahle.....A. Jameson
Bottle. Non-refillable.....P. Harder
Bottle. Non-refillable.....H. C. Johnson et al
Bottle stand. Ink-.....H. J. Baker
Bottles, jars, &c. Closure for...M. Hofheimer
Box.....J. E. Smith
Box-fastener.....L. B. Prahar
Boxes cases, and similar receptacles in place. Device for holding the lids of.....A. D. Bentley
Bracket.....D. McIntyre
Bracket.....L. Nolan
Brake-shoe.....J. D. Gallagher
Brake-shoe.....F. R. Spear
Brush.....H. W. Hascy
Brush.....W. D. Foss
Brush.....F. H. Lumbard
Brush. Combination blacking-.C. W. Jones et al
Buckles, &c. Combined strap and protector for harness-.....W. E. Barber
Bushing. Bung-.....G. H. Ricke
Bustle.....E. H. Wright
Button-tuft.....D. B. Shantz
Cabinet and display-rack for neckties.....L. M. Speer
Camera multiplying-back.....W. C. Seckler
Cameras. Appliance for adjusting and working iris diaphragms of photographic.....A. Watkins et al
Can-body-forming machine.....J. A. Gray
Can-heading machine.....N. Troyer
Can-heading machine.....J. L. Allen
Canceling and postmarking machine.....M. V. B. Ethridge
Car. Convertible street-.....G. J. Knoll
Car-door.....G. W. Leavitt
Car-fender.....G. R. Owings
Car grain-door.....J. E. Abbott
Car-roof.....S. Otis
Car shock-absorber. Motor-.....A. Dutrieux
Car side bearing. Railway-.....J. Jacob
Car signal. Street-.....G. S. Henninger
Car-steering mechanism. Motor-..G. H. Coates
Car-wheel-flange greaser. Automatic.....M. W. Willson
Car. Street-.....W. P. Michel
Cars. Connecting device for disabled railway-..R. P. Williams
Carbid-feeding device.....A. Davis
Carbonator.....E. E. Murphy
Carbureter.....J. G. P. M. Monnier et al
Carbureter.....L. Bollée
Carbureter.....C. C. Walter
Carbureter.....H. B. Cornish
Carbureter.....J. A. McHardy
Carbureter air-intake regulator.....F. C. Reineking
Carbureter for explosive-engines. Double.....T. L. and T. J. Sturtevant
Cards or paper. Machine for feeding.....J. P. Wright
Carpet-cleaning machine.....R. B. Hutchison
Carriage escapement mechanism..W. P. Kidder
Carriage. Folding baby-..I. N. and G. E. Dann
Carrier.....J. Hall
Cartridge-shells. Reshaping and restoring.....W. T. Alsop
Caster.....G. C. Fuller
Ceiling construction.....V. Moeslein
Chair, 2 pats.....J. Flindall
Character impressions. Mechanism for producing.....F. H. Richards
Charcoal-drying apparatus.....R. S. Kent
Chuck. Drill-.....G. A. Orr
Churn.....A. M. McKoy
Cleaning-machine.....E. C. Keckeley et al
Clock. Electric.....F. Hope-Jones
Clothes-drainer.....F. P. Sager
Clothes-line bracket.....J. D. Schmidt
Clothes-supporter.....A. J. Cavana
Clutch controlling mechanism.....A. H. Ehle
Clutch. Fluid-pressure.....E. G. Shortt
Coal-cutting machine.....A. Hopkinson
Coal-washer.....D. H. and G. S. Gray
Coaling apparatus for bunkers, &c. Automatic.....A. Bliedung
Coaster-brake. Back-pedaling.....J. N. Parks
Coating of one metal to the surface of another. Applying a.....A. Freier
Cock. Stop and waste.....W. V. McNamara
Coffee-pot, 2 pats.....J. S. Dunlap
Coffee-urn.....W. J. Williams
Coke-over door.....H. Koppers
Collapsible box.....H. T. Newby
Collapsible table.....G. Benjamin
Colloidal state. Converting elements into the..H. Kuzel
Column-joint.....C. Drayer
Comb-frame lifter.....C. E. Dow
Combustion apparatus.....J. M. W. Kitchen
Combustion-engine. Twotime...E. Tuckermann
Concentrator.....C. H. Wilkie
Concrete and other plastic materials. Device for molding.....C. Dietrichs
Concrete-floor structure.....F. H. Daniels
Concrete mixing and molding apparatus.....C. R. Schmidt
Concrete reinforcement.....C. Horix
Concrete-wall-constructing apparatus.....C. Dietrichs
Connecting and spacing clip..R. A. Cummings
Controller.....T. Gilmore, Jr.
Controlling mechanism.....H. W. Cheney
Conveyer. Sheet-metal.....G. Wenzelmann
Conveyer system.....F. C. Hrdina
Cooling heated surfaces. Means for.....J. H. Sager
Cotton-chopper.....W. L. Rose
Cotton-picker.....H. P. Childress
Cover for jugs, teapots, and like vessels.....S. Hall
Crane.....G. W. Bragg
Current motor. Alternating-.....L. Schüler
Current motor. Alternating-.....C. A. Lohr
Curtain pole and bracket.....J. Watson
Curtain-pole pulley-holder.....D. M. Sarkisian
Curtain-protector and sham-holder. Combined..M. Keith
Curtain-rod support.....G. W. Palmer
Curtain and scenic drops. Means for trimming and controlling.....F. S. Madigan
Cushion work. Spring-.....W. R. Smith et al
Cut-estimator.....O. A. Kenyon
Cycle-motor into a two-stroke cycle-motor. Mechanism for changing a four-stroke.....S. Löffler
Damper-regulator.....W. R. Forbush
Damper-regulator.....B. F. Lutz
Dental bracket. Combination.....G. Hall
Derrick. Portable field-.....A. N. Hadley
Die.....A. H. Worrest
Display device.....W. J. Shortill
Display stand. Veiling-.....E. S. Aiken
Door-hanger.....J. H. Burkholder
Doubletree-fastener.....C. J. Minton
Dough-divider, 2 pats.....F. Streich
Draft attachment. Spring.....R. G. Krueger
Draft device.....A. Cameron
Drain-pipe.....E. J. Cochran
Dredge.....J. B. Webber, Jr.
Driving mechanism. Variable-speed.....N. Christenson
Dust from upholstered furniture, &c. Apparatus for sucking.....O. D. Skibsted
Dyeing machinery.....J. Sulzbach
Egg-beater.....W. H. Tomlinson
Electric furnace.....P. L. T. Héroult
Electric furnace and method..P. L. T. Héroult
Electric heater.....H. M. Wicker
Electric-machine bridging-blocks. Dynamo.....E. Heitmann et al
Electric meters. Device to disclose shunting of the circuits around.....W. L. Saunders
Electric-wire connection.....F. B. Thatcher
Electrical switch.....F. Orzel
Electrically-operated fountain...A. D. Southam
Electrogenic body device.....A. R. Cooper
Elevator-shaft door.....J. Rashkin
Engine.....J. Rothchild
Engines. Lead-controlling mechanism for steam-.....W. L. Braman
Explosive.....G. W. Gentieu
Eyeglass or spectacle case.....F. A. Reinhard
Fan. Electric.....W. C. McChord, Jr.
Fan. Rotary.....C. E. Campbell
Fastener.....J. Senn
Fastener.....D. W. Palmer
Faucet. Measuring-.....C. W. Bauman
Feed-chopper.....J. F. Raymond
Fence construction.....J., S., and T. Hohulin
Fence-tie.....G. Prarie
Fencing-stretching device. Wire-.W. M. Owen
Fetter. Animal-.....B. Hollinshead
Filing-cabinet.....O. L. Solie
Filter.....T. C. Martin
Fire-extinguisher. Chemical.....W. H. Shafer
Firearm.....A. H. Worrest
Fireproof window construction, 3 pats.....E. H. Lunken et al
Fireproof window construction, (laterally-inserted glass.).....E. H. Lunken et al
Fish-bait.....L. Debroisse
Fishing-net. Apparatus for controlling.....I. A. Ketcham
Fishing-reel.....E. L. Gilmore
Fishing-reel, 2 pats.....E. E. Kleinschmidt
Floor-finishing device.....W. Shears
Flying shears for rod or bar mills.....W. H. Stanton
Force-feed sight-lubricator. Multiple.....A. P. Klumph
Frost. Apparatus for ascertaining the probability of.....L. H. Bernel
Fruit-press.....S. E. Warren
Frying-pan.....H. L. Hendal
Furnace.....W. Stubblebine
Furnaces. Feeding reverberatory.H. L. Charles
Gage packing-nut. Water and oil.....J. E. Montgomery
Galvanic battery. Reversible.....T. A. Edison
Garment-hanger.....E. K. Myers
Garment-supporter.....M. M. McLeod
Gas-condenser.....H. Auchu
Gas-engine.....P. H. Bissell
Gas-engine.....J. Houlehan et al
Gas-engine. Rotary.....J. Pollock et al
Gas. Generating.....G. W. Bulley
Gas-generator.....S. C. Gorsuch
Gas-generator. Acetylene-.....C. E. Malmborg
Gas-lighter. Individual electric.W. K. Davidson
Gas lighting and extinguishing device.....A. Meyer
Gas-meter. Prepayment.....N. D. Nelson
Gas-producer-feeding apparatus...W. R. Miller
Gas-saturating device.....J. B. Merwin
Gate.....C. Schäffer
Gear for motor-lorries and other vehicles. Transmission-.....A. Clément
Gear. Reducing-.....G. and F. Schoedelin
Gearing.....B. Ljungström
Gearing. Changeable-speed.....E. H. Manning
Gearing. Changeable-speed.....A. L. Muren
Gearing. Changeable-speed.....J. G. and C. D. Hawley
Glass-drawing apparatus. Hoisting-gear for.....R. L. Frink
Go-cart. Folding.....F. B. Moreland
Goggles.....E. B. Meyrowitz
Gold and silver from ores. Extracting.....G. Gurney
Governor. Electric and pneumatic.....W. K. Rankin et al
Governor. Electromechanical power-.....G. H. Davis
Grader.....G. A. Bell
Grading and bordering machine. Combined.....A. H. Kroschel
Grain. Device for picking up lodged or battered-down.....E. W. Fraasch
Grain-separator.....G. W. Tice
Grate. Fire-.....C. M. Graham
Grinder. Feed-.....E. E. McCargar
Gun-carriage. Disappearing.....J. Krone
Hair-drying implement.....J. A. Paasche
Hair-pin.....J. T. Leonard
Hair-pin.....G. H. Spray
Hame and trace connection.....A. A. Galt
Hammock.....W. Gray
Hams. Apparatus for preparing and storing boiled.....L. Wirth
Harness.....E. G. Burkhardt
Hasp.....J. C. Morgan
Hat and coat hanger.....A. A. Lott et al
Headlight. Locomotive-.....C. P. Johnson
Heater.....J. E. Peck
Heating and lighting burner.....A. Mouneyrat
Heels or soles of boots and shoes. Metallic protector for.....J. H. Vinton
Hemoglobinometer.....R. L. Watkins
Hoe. Trenching-.....E. B. Cahoon
Hoisting-device safety-brake...G. A. Armington
Hook and eye or the like.....M. J. Keane
Horse hitch. Three or four.....F. G. Alvord
Horse-releaser.....O. D. Brockette
Hose-nozzle.....J. P. Buckley
Humidity-reducing apparatus....R. H. Thomas
Hydrocarbon-burner for furnaces.....B. L. Worthen
Hydrocarbon-motor.....E. Koch
Hygrometer for humidifying and air-moistening apparatus.....S. W. Cramer
Igniting-tape and producing same...A. T. Herr
Index. Book.....W. H. Robertson
Index-filing system.....J. E. Blaine, Jr.
Indicator-lock.....O. Lockett
Insect-trap.....J. W. Spurrier
Insulating device.....G. E. Wood
Insulator-pin mounting.....J. D. E. Duncan
Internal-combustion engine.....A. Rollason
Internal-combustion engine. Multiple-piston...C. E. Van Auken
Jar opener, tightener, and presser. Combination fruit-.....W. Abel, Jr.
Joke-box.....G. E. Ames
Journal-bearing.....W. J. Francke
Keg-handling mechanism.....A. G. Hupfel
Kettle.....H. C. Benefiel
Knee-pad. Pneumatic.....W. Long
Labeling-machine.....F. W. Wild, Jr.
Lamps. Apparatus for automatically lighting gas.....K. Pank
Land roller and packer.....B. H. Peck
Lantern.....J. R. M. Tisdale
Lantern.....W. S. Hamm
Lantern tube.....C. L. Betts
Last. Collapsible.....F. J. Nugent
Last. Contracting.....J. J. Smith
Lathe for marble or the like.....J. R. Peirce
Lathe-tool.....J. P. Aylesworth
Leaves. Contrivance for turning pamphlet or book.....B. Sharp
Lid-supporter and price-tag holder..F. Canfield
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Liquids. Storage and transference of inflammable.....C. Martini et al
Liquids with gas. Means for impregnating.....H. Stroh
Lithographic plates. Graining metallic.....C. M. Kneppler
Loading attachment. Wagon.....E. Lauppe
Loaf-forming machine.....E. W. Smith
Loaf-molding machine. Long-.....F. Streich
Locomotive-controller. Automatic.....J. E. Stiegelmeyer
Loom.....F. Johnson
Loom electric wrap stop-motion...J. W. Moran
Loom for weaving pile fabrics.....C. B. White
Loom harness-motion.....C. F. Roper
Loom picker mechanism.....R. H. Ingersoll
Loom shedding mechanism...A. A. Gordon, Jr.
Loom shuttle-checking means.....M. Morey
Loom warp-beam brake mechanism.....F. Johnson
Loom weft-replenishing mechanism.....F. P. Rogers
Looms. Emergency stop-motion for narrow-fabric.....S. Kendrick
Lounge. Reclining-.....J. Flindall
Machine-wrench and clamp. Combined.....C. J. Coulter
Magnetic separator, 4 pats.....A. Schwarz
Mail-bag catching and delivery mechanism.....P. A. Poché
Mail-bag ejector. Automatic.....R. G. Thornhill et al
Mail collecting and delivering means.....W. H. Mozingo
Mail-transfer device.....H. B. Burke
Mailing-machine. Automatic...B. S. Molyneux
Manifolding bill pad or book..P. A. McCaskey
Massage implement.....F. E. d'Humy
Measuring apparatus. Liquid-..P. C. Forrester
Mechanical movement.....W. R. Comings
Merry-go-round.....W. S. Thurlow
Metal pipe. Jointed.....J. Dunkel
Meter.....D. E. Scrafford
Mold.....J. B. Blaw
Motor-control system.....W. F. Schneider
Motor-drive arrangement.....E. W. Stull
Mowing-machine.....J. H. Burhop
Multicopying-machine.....A. C. Staley
Music-rack.....A. De Long, Sr.
Music-sheet.....D. H. Haywood
Musical instrument.....F. Wagner
Musical instruments. Cut-off for pneumatic.....E. de Kleist
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Necktie.....C. W. T. Davies
Nitrites. Making.....O. Schönherr et al
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Nut-lock.....A. B. Machlin
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Oil-burner.....W. H. Van Marter
Oil-burner.....W. R. Jeavons
Oil-burner. Air-carbureting.....W. N. Best
Oil-burner for lamps and stoves.....F. A. Baynes
Optical instrument.....E. C. Bridge
Ore-concentrating table.....A. Schwarz
Ores. Concentrating.....A. Schwarz
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Organ-pipe.....W. E. Haskell
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Paint-remover.....M. Toch
Panel-board.....H. Krantz
Paper and producing the same. Manifold.....E. E. Linfoot
Paper-box-blank-making machine.....J. W. Denmead
Paper box. Folding.....C. F. Raynaud
Paper-cutting machine, 2 pats....T. C. Dexter
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Percussion-drill, &c.....B. H. Locke
Photographic lens.....C. and H. C. Beck
Photographic-plate-developing apparatus.....A. Gaffney
Photographic toning and mounting process.....H. Schmidt
Pigments by electrolysis. Producing, 2 pats...E. D. Chaplin
Piling. Interlocking means for sheet-.....G. E. Nye
Piling. Sheet-.....L. P. Friestedt
Pipe.....C. C. Haskell
Pipe-cap.....W. H. Blood, Jr.
Pipe-joint. Flexible.....A. L. Greenlaw
Pipe joint. Waste-.....H. J. Luff
Pipe-wrench.....R. Parmelee
Placket-closure.....J. A. Holly
Planter.....J. C. Morgan
Planter and fertilizer-dropper. Corn-.....W. J. Downs
Plates. Producing half-tone....C. H. McIntosh
Platinum contact.....A. Freier
Plow. Expansion-.....J. T. Foulke
Plow-point fastener.....J. J. Dorman
Plows. Plowing-under attachment for.....T. J. Churchill
Plumb and level device. Spirit.W. Foster et al
Pneumatic-despatch-tube apparatus. Carrier for.....I. W. Litchfield
Pneumatic gate...W. P. and W. P. Elliott, Jr.
Poultry-fountain.....W. Swagler et al
Power-driven machines. Shifter-rod for.....M. F. Field et al
Power in engines and self-propelled vehicles. Apparatus for generating and utilizing.....M. W. Hall
Press for molding suppositories, &c.....E. Endemann
Press-setting attachment.....G. A. Holmes
Pressure regulator and reducer.....H. P. Dyer
Printing-card.....E. H. Frey
Printing measurements on pieces of material. Machine for.....P. Sperling
Printing-plate by photo-engraving. Making a..A. P. Miller
Printing-presses. Platen-throw-off machanism for.....G. W. Prouty
Projectile.....G. W. Gentieu
Propelling means. Vessel-.....G. Pino
Propelling mechanism. Boat-.....M. Damzin
Propelling mechanism. Boat-.....T. Thorsen
Pump.....P. A. Myers
Pump.....C. L. Newcomb
Pump. Air-.....G. De Laval
Pump and the like. Centrifugal and turbine..C. H. Jaeger

Pump. Deep-well.....G. C. Richards
Pump-rods for oil-wells. Adjustable grip for surface.....H. McBrier et al
Pump. Twin air-.....W. A. Drewett
Pumping apparatus.A. C. E. Rateau (Reissue.)
Punching-machine.....E. Southworth
Quilting-frame.....A. Wittwer
Rail-bond.....C. Y. Haile et al
Rail-joint.....M. H. Brink
Rail-joint.....A. T. Palmer
Rail with triple head....A. V. P. M. Merthier
Railway cross-tie. Metallic.....F. P. Brining
Railway. Pleasure-.....L. D. Shaw
Railway-signal.....L. H. Thullen
Railway signal and safety appliance.....G. W. Gerlach
Railway. Surface electric.....T. Mahoney
Railway-tie.....W. C. Mayo et al
Railway-tie.....E. Henry
Railway-tie-boring machine.A. H. Handlan, Jr.
Railway-tie. Metallic.....L. M. Wright
Railway-track construction.....E. K. Morse
Railway-track structure.....R. E. Einstein
Railway traffic on single lines. Apparatus for insuring safety of.....E. Tyer
Railway-trains. Protection of..A. R. A. Gérard
Rake attachment. Hand-.....F. F. Horn
Rake, swath-turner, and other like implement or machine. Side-delivery.....W. E. Martin
Range.....W. Reid
Razor-guard.....G. Tittmann
Receptacle. Hinged.....J. V. Reed
Receptacle. Outdoor.....J. S. Stewart
Recorder.....E. A. Oakes et al
Refrigerating apparatus.....C. J. Coleman
Refrigerating apparatus.....J. J. Glauser
Rein-guide. Antifriction.....C. Kenney et al
Reinforcing-bar.....M. Haupt
Retort. Charcoal-.....W. A. T. Willink
Rifle-loader.....E. E. Morlan
Ring-and-roller mill.....E. Barthelmess
Rock-drill.....E. N. Jones
Rotary engine.....W. Lauber
Rotary engine.....J. L. Clayland
Rotary engine.....C. W. Puckett
Rotary engine.....E. Scott
Running-gear reach-coupling....G. W. Loeffler
Salt-shaker.....L. Hinsberger
Salves and ointments. Making mercury.....F. Fuhrmann
Sanding and polishing machine.....D. T. Clemons
Sash-bar fastener. Metallic-.....G. A. Bischoff
Sash-construction, 3 pats.....E. M. Erb
Sash-lock.....E. H. Lunken et al
Sawing-machine. Band.....L. J. Hanhart
Scaffold-trestle. Adjustable..H. J. Whipperman
Scaling-machine.....G. J. Capewell
Scraper. Road-.....E. P. Scholl
Screw-cutting die and holder therefor.....A. J. Smart
Screw-driver.....G. E. Wood
Scrubber and mop. Combined...F. S. Thomas
Sculpturing-machine.....A. Bontempi
Seed-separator.....E. Thompson
Seed separator. Cotton-.....M. M. Edwards
Separator shaking mechanism.....F. and T. Chipera
Sewing-machine presser-foot and guide combined.....G. J. Stevens
Shaft-hanger.....E. E. McIntyre
Sheet-delivery apparatus.....C. L. Johnston
Shell. Explosive hand-.....N. W. Aasen
Shells. Apparatus for reshaping and restoring.....W. T. Alsop
Ship loading-hatchway.....J. Closter
Ships. Keel-block for.....T. H. Alcorn
Shoal-indicator.....W. Bangs
Shock loading-apparatus.....R. Tanner
Shoemaker's knife.....F. Kleemann
Shutter-operator.....R. Moskau
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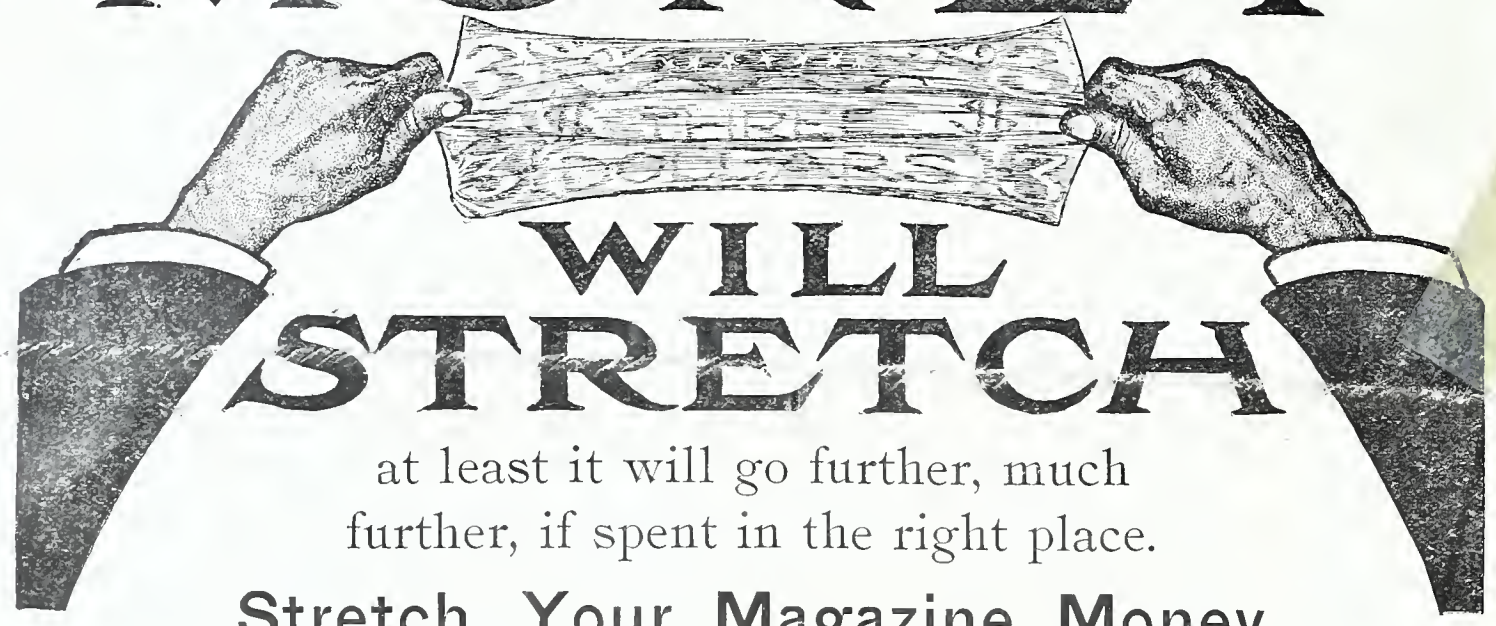
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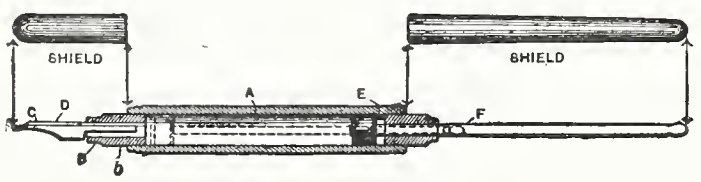
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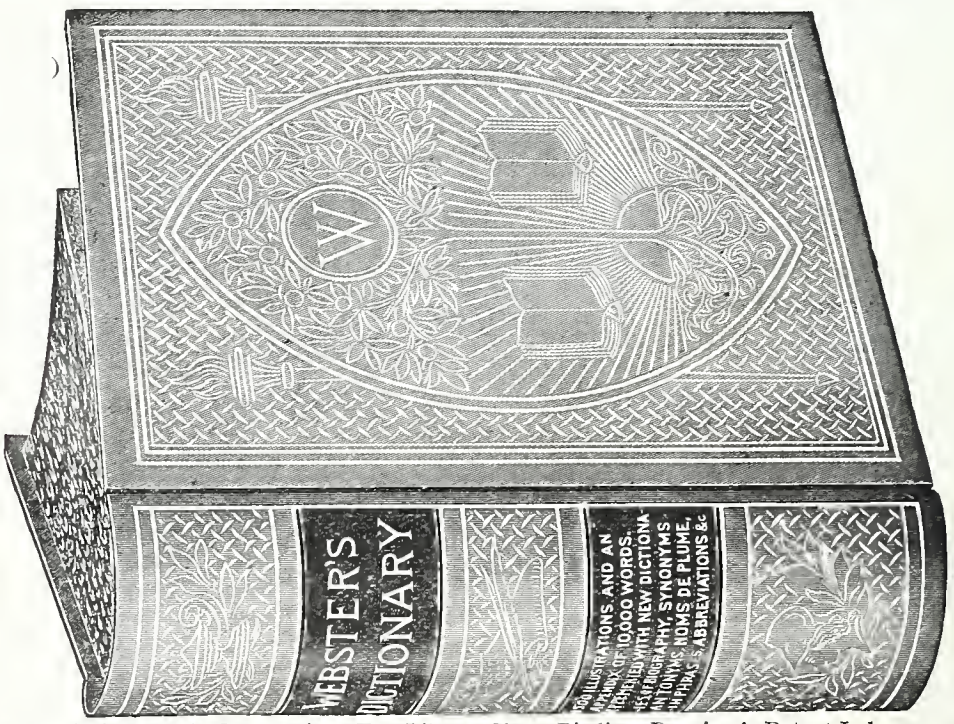


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A PHOTO-PRINTING TELEGRAPHIC APPARATUS.

By EMILE GUARINI.

IN the domain of telegraphy as in many others the twentieth century, which is still but a child of yesterday, has no reason to be envious of its predecessor. Among the most remarkable of modern devices must be ranked a photo-printing telegraphic apparatus which is owned by the German firm of Siemens & Halske.

As in the Wheatstone printing telegraph apparatus, a perforated band is first prepared, which is introduced into the automatic transmitter, where the holes in the paper cause alternately positive and negative discharges. In the receiver a strip of photographic paper is unwound in a dark chamber in front of a type wheel, upon the periphery of which the letters of the alphabet are perforated (see Fig. 1.) This wheel moves synchronously with the transmitter; at the moment when the letter transmitted passes in front of the sensitive strip an electric discharge takes place between the spheres of an oscillator, and the letter is photographed. As the type wheel revolves at the rate of 2000 revolutions per minute, and as a letter can be printed at each revolution, the speed of transmission can be calculated at 20,000 words per hour.

The perforator is composed of styluses distributed in a manner which make in a strip of paper two holes for each letter, following an oblique line. The styluses are operated by keys forming a keyboard like that of a typewriter, and the mechanism for moving the paper is operated by a small electric motor.

The complete transmitter is shown in Fig. 2. To the right there is seen the part where the strip bearing the message is introduced; this strip, pulled along by the electric motor, runs in front of a system composed of eleven springs to which as many contacts correspond.

An examination of Fig. 3 (next page) will at once enable the reader to grasp the modus operandi of these organs, which are completed by a transmitting disc, the object of which is to give perfectly distinct signals while regulating the discharges.

As shown, the perforations are slightly delayed one behind the other; they produce negative and positive discharges succeeding at intervals of time determined by the position of the holes; these latter are, as a matter of fact, in perfect alignment in a longitudinal direction, following imaginary horizontal lines to the number of eleven (equal to the number of springs); each spring terminates in a pin, oscillates between two stops and is connected to the segment of a contact fixed on the periphery of a transmitting disc (similar segments, one of which is earthed.) The transmitting disc, the centre of which is on the axis of the motor, is fixed: but a brush, moved by the shaft. rubs upon the segments. When the strip has no perforations, the springs are held against the upper stops; but as soon as a hole passes in front of one of the springs, it is released, and bears against the lower contact or terminal in contact therewith. If a discharge resulting from this contact were used direct for working, a precise transmission could not be obtained, the duration of the discharge being too long, and hence it was found necessary to have recourse to the transmitting disc. When the spring has been lowered it is still necessary, in order that the transmitting relay may be placed in operation, that the arm of the disc should pass over the segment corresponding to the spring flexed, whereupon the following takes place. In Fig. 3 the line is shown traversed by a positive current, which is produced by means of a small generator mounted upon the shaft of the motor and which may be seen in Fig. 2 to the extreme left. The brushes of this generator are connected by a resistance the central point of which is earthed, thus enabling a positive or negative current (see Fig. 3) to be sent along the line by the simple oscillation or balancing of the armature of the relay. Should the brush of the disc rub against a segment the spring of which is lowered, then a circuit is established which charges the reversing condenser. As to the relay, we assume it to be such that its armature will not move for a current having this direction, but directly the brush touches the following segment—the spring of which is raised—the reversing condenser is discharged and a discharge, contrary in direction to that which first prevailed in the relay, now circulates in this latter and its armature effects the transmission over the line of the negative current emanating from the generator. Upon another perforation succeeding to the first, a spring will be released and the reversing condenser will be charged negatively, and the armature of the relay will not move. With the following segment the discharge will take place and cause the displacement of the armature, thus

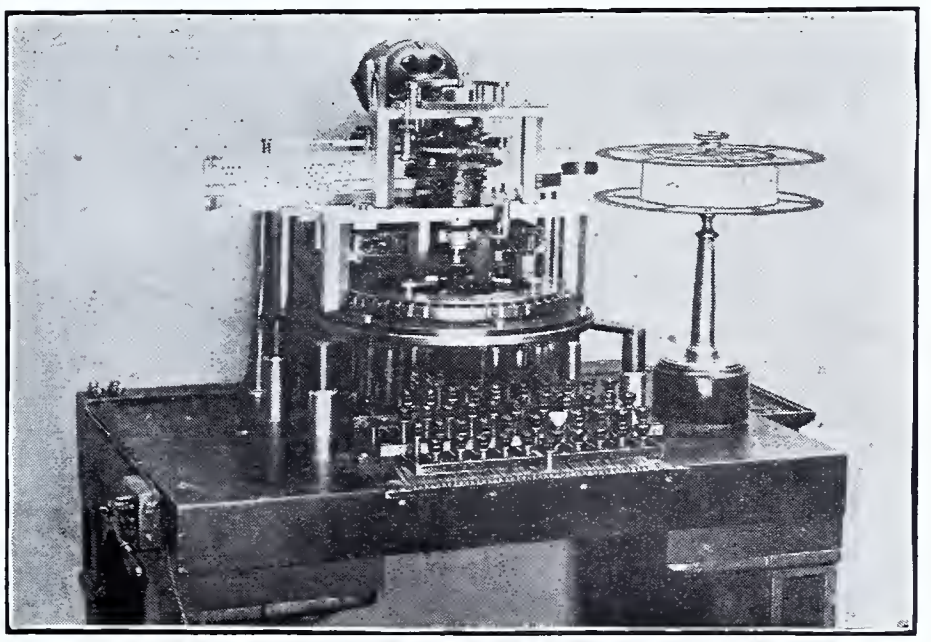


FIG. 1.—PERFORATING ATPARATUS.

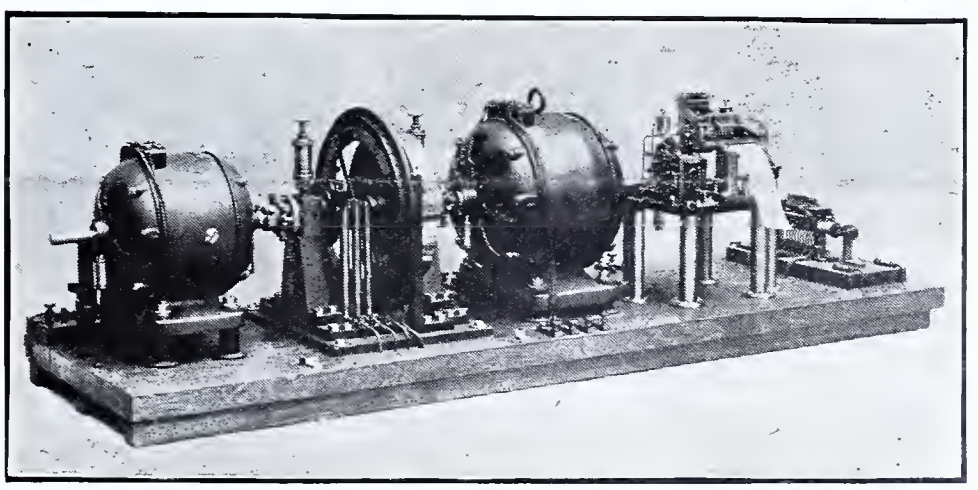


FIG. 2.—COMPLETE TRANSMITTER.

sending a negative current into the line. Briefly put, this latter is traversed by positive and negative currents, the duration of which depends upon the position of the perforations in the strip, *i. e.* upon the position of the letters.

The point of prime importance is to obtain perfect synchronization between the transmitting and receiving organs. This is effected by means of a regulating apparatus, a description of which would protract this article to an undue length. Suffice it to say that its operation is both electrical and mechanical; it is mounted on a special table, upon which the other accessories are also placed, viz. the line relay, the connecting relay, and the oscillating relay. This table is also provided with an ordinary Morse fitting. The synchronizing organs are composed of a small regulating motor and of a regulating disc.

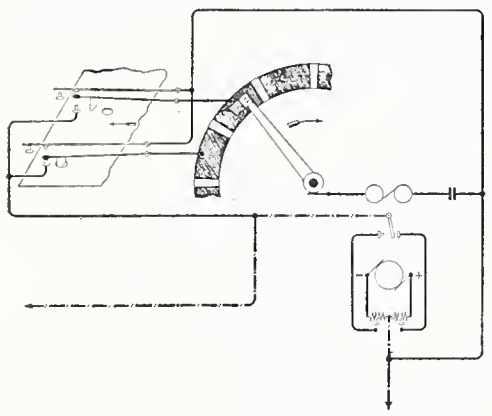


FIG. 3.—CONTACT ARRANGEMENT OF AUTOMATIC TRANSMITTER.

The line currents are received in a relay which operates, by means of a high tension current, the automatic receiver. This latter comprises a motor, the shaft of which rotates at a speed of 20,000 revolutions per minute, in synchronism with the transmitter; four discs, two of which are made to agree with each other; (these discs are intended to produce a rapid and brilliant electric discharge, adapted for printing purposes); the type wheel, upon the periphery whereof there are distributed in nine groups small pieces, upon which are cut the letters and other characters. Each disc has nine contacts, the duty of which we will deal with later on. The type wheel rotates between the two spheres of an oscillator and a photographic strip. The spheres of the oscillator, the type wheel, the strip, and the mechanism for moving the latter, are all placed in a dark chamber, which contain the developing and fixing baths.

The discs of the receiver, of which we have spoken, are therefore present to the number of four. The first is the charging disc; it carries nine contact segments, each of which communicates with a condenser of which there are, consequently, nine which, for the sake of clearness, we will number 1, 2, 3, ... 9. Similar to the others the charging disc is stationary, but a brush rotates frictionally upon the segments. A positive current in the line relay causes the armature to take up such a position that the condenser corresponding to the segment that touches the brush is charged. The second or discharge disc is in accord with the third or connecting disc; upon its periphery there are arranged nine groups of contacts each comprising nine contacts. The first contact of each group communicates with condenser number 1; the second with condenser number 2; the third with number 3 and so on. A primary selection is made on charging, *i. e.*, thanks to the synchronization, either the one or the other of the condensers is charged; let us assume that number 3 condenser is that which has been charged. We can now say, right from the beginning, that the letter transmitted is one of those corresponding to the third segments of the groups of the discharge disc. A negative discharge on the line causes the armature of the relay to oscillate, and this brings it into the discharging position. The second movement now comes into operation; *i. e.* this oscillation of the armature takes place at the moment when the brush passes in front of the group which contains the charged segment corresponding to the letter transmitted. The discharge is produced by the agency of the disc of the connecting relays and of the oscillating relay; it traverses the primary winding of an inductor which, by induction, charges the spheres of an oscillator inserted in the circuit of the secondary winding, and a very brilliant spark is produced.

The type wheel carries nine groups of letters corresponding to the groups of contacts of the discharge disc. These letters are cut in copper strips and they are not arranged according to a regular circumference, but in a spiral form. This mode of construction is explained at once if it be assumed that the sparks succeed at unequal periods of time, while the strip is being uniformly unwound. By this very simple means signals placed at an equal distance from each other are secured.

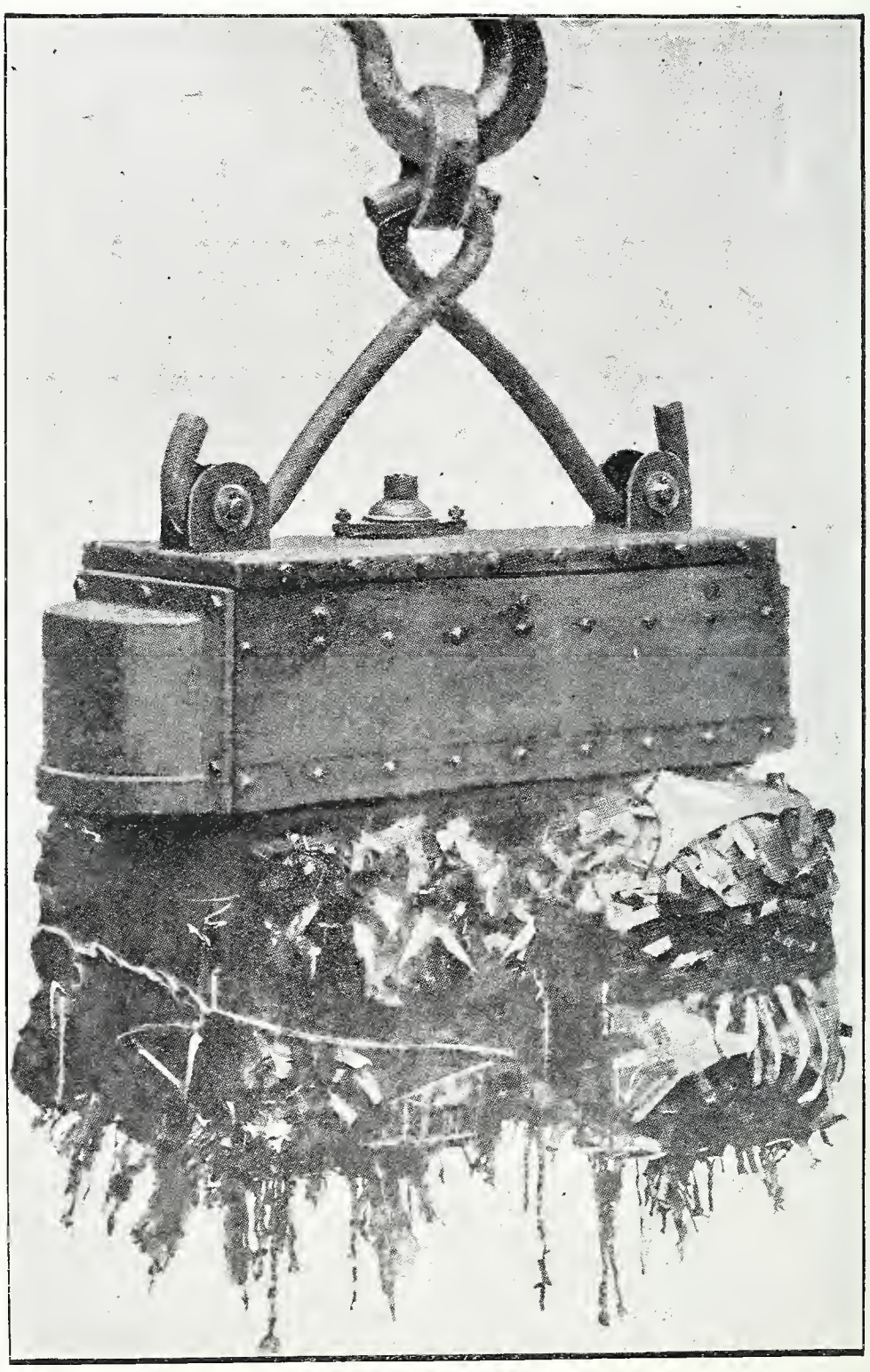
It will be seen that the apparatus is exceptionally ingenious, and its conception is a step astounding in its boldness.

Microscopic Engraving.

Among the arts known in the Middle Ages and since then lost to the world, is that of engraving on a very space. The Lord's Prayer, engraved within a circle no larger than the point of a pin, has been the wonder and despair of modern workers in metal. But progress is being made in this direction; the same prayer was engraved a few years ago on the back of a gold dollar; then the alphabet was placed on the head of a pin; and the best of recent achievements is the engraving of two full alphabets, a name and a date on the head of a pin that measures only sixty-five one-thousandths of an inch in diameter. This feat was accomplished by one of the experts of the Bureau of Engraving and Printing in Washington, and took half a day's work. To see the letters requires a powerful magnifying glass.

LIFTING MAGNETS.

One of our infant industries, that bids fair to develop into lusty manhood, is the manufacture of commercial magnets. The number of magnets in use for lifting purposes is relatively small, taking into consideration the large number of establishments which could profitably employ such devices. This, however, is largely due to the fact that the advantages of the new method are not generally realized. It is worthy of note that no plant that has tried the lifting magnet has returned to the old way of handling iron and steel.



A LIFTING MAGNET FOR HANDLING PIG IRON, SCRAP, ETC.

Wherever pig iron, metal plates, tubes, rails, beams, scrap or heavy castings are handled, lifting magnets are the best device for the work. Much time is saved in adjusting hoisting tackle, and a great number of small objects can be handled at one haul, without having been previously piled up. All that is needed is to lower the magnet over the pieces to be lifted, turn on the current and lift. Another advantage is that metal too hot to be touched with the fingers can be handled as easily as cold metal.

Magnets for handling rails, billets, etc. are usually operated in pairs, placed about 20 feet apart on a balancing bar to which the crane hook is attached. Magnets for handling pig iron, scrap, etc. are especially constructed for this purpose. One of the latest has the magnetic attraction of the inner pole made stronger than that of the outer, so that when the current is turned off, the pieces constituting the load are released by the outer pole first. They are also drawn toward the centre of the magnet by the superior attraction of the inner pole, which enables the operator to deposit the load within an area scarcely exceeding in size the diameter of the magnet itself.

A HUNDRED MILLION TIES A YEAR.

Railroads Paid $50,000,000 in 1906, and Used Timber Equivalent to the Whole Product of 600,000 Acres of Forest.

In the construction of new track and for renewals, the steam and street railroads used, in 1906, over one hundred million cross-ties. The average price paid was 48 cents per tie. Approximately three-fourths of the ties were hewed and one-fourth sawed.

Oak, the chief wood used for ties, furnishes more than 44 per cent, nearly one-half of the whole number, while the southern pines, which rank second, contribute about one-sixth. Douglas fir and cedar, the next two, with approximately equal quantities, supply less than one-fifteenth apiece. Chestnut, cypress, western pine, tamarack, hemlock, and redwood are all of importance, but no one of them furnishes more than a small proportion.

Oak and southern pine stand highest in both total and average value; the average value of each is 51 cents. Chestnut ranks next, followed by cedar. Hemlock, at 28 cents, is the cheapest tie reported.

More than three-fourths of all ties are hewed; and with every wood from which ties are made, except Douglas fir and western pine, the number of hewed ties is greater than the number sawed. About ten times as many Douglas fir ties are sawed as are hewed. Of the oak ties a little over one-sixth and of the southern pine ties less than one-third are sawed. In contrast to the southern pines is the western pine, of which more than one-half the ties are sawed. In general, when lumber has a relatively low value the proportion of sawed ties increases, because the market for ties is always active, while that for lumber is frequently sluggish. All western species are affected by this condition, for stumpage is abundant and its value relatively low.

Ten per cent of the ties purchased were treated with preservatives either before they were purchased or at the treating plant of the railroad company. At least ten railroad companies are operating their own plants for the preservation of their construction material.

Of the many forms in which wood is used, ties are fourth in cost, sawed lumber being first, firewood second, and shingles and laths third. It has been calculated that the amount of wood used each year in ties is equivalent to the product of 600,000 acres of forest, and that to maintain every tie in the track, two trees must be growing.

With nearly 300,000 miles of railroad trackage and approximately 2,800 ties to the mile, there are over 800,000,000 ties constantly subject to wear and decay. The railroads report that in the form of ties cedar lasts eleven years, cypress ten years, and redwood nine years. These woods, however, lack the desired weight and hardness, and, what is more important, they are not available in the region of the trunk lines of the Central and Eastern States. When it is considered, then, that the service of the longest-lived tie timbers in general use—chestnut, white oak, tamarack, spruce, and Douglas fir—is but seven years, while with some, as the black oaks, it is but four years, whereas a treated tie with treatment to lessen wear will last fifteen years, it is apparent how much the railroads can save if preservative treatment of ties is universally adopted. The saving in the drain upon the forests is of even greater moment.

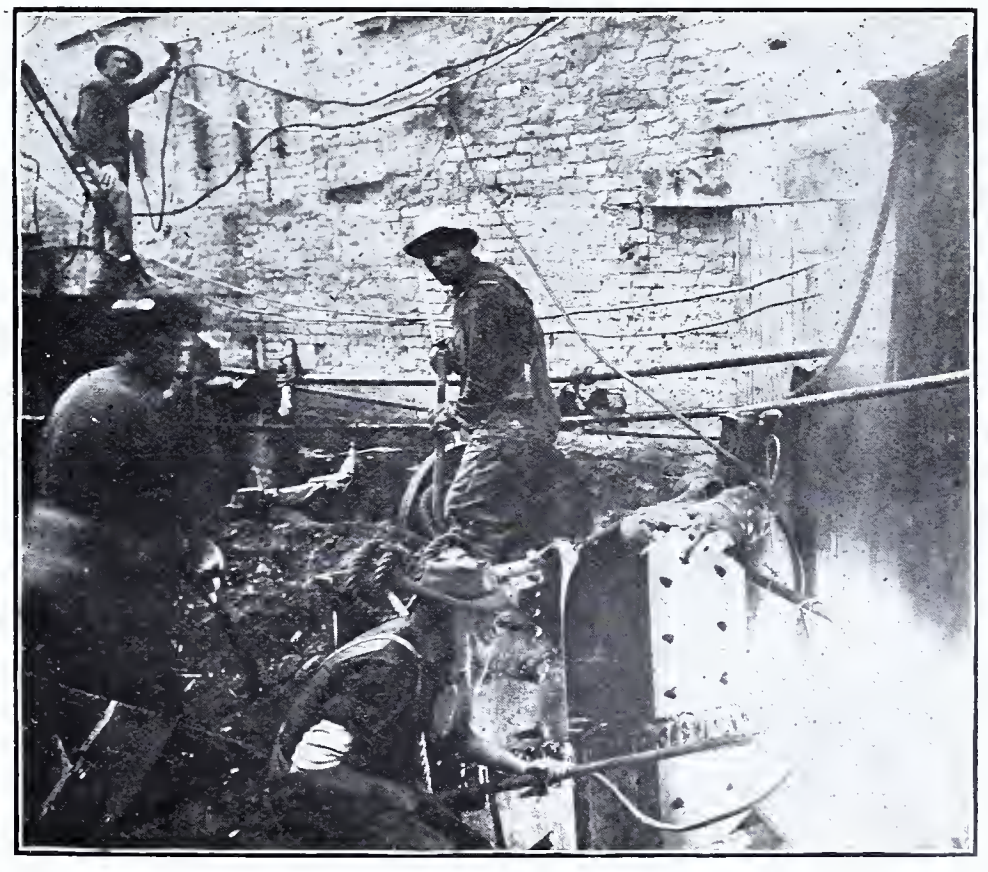
THE ELECTRIC ARC IN CUTTING STEEL.

By FRANK C. PERKINS.

It is well known that the electric arc has been utilized in cutting open steel safes and for other service of this character where the expense and time required by other methods were almost prohibitive, and in some cases well nigh impossible.



The accompanying illustrations show an interesting instance of electric steel burning by means of the arc in operation at the new Hoffman House in New York City. The steel is cut off evenly and with great dispatch, the contractors, Thompson-Starrett Company, having cut about 1500 feet of this steel up to this writing.



As shown in the illustrations, the men are protected from the extreme heat and terriffic glare by goggles and asbestos masks as well as gloves, as it has been found that the carbon fumes, produced by the high power electric arc, affected the lips and other parts of the face and hands.

At this writing about 1200 amperes are being utilized at 50 volts pressure, alternating current being employed stepped down to the above voltage from the high pressure service of 2500 volts. The single phase alternating current employed is taken from the street service mains, the frequency being 60 cycles per second.

The steel being cut is ⅝ inches thick and 3 inches at the interlocking point. It is stated that the time required in burning the ⅝ inch steel is four minutes per foot, and the time taken at the interlocking points is said to be about 8 minutes.

The arc light carbon is held in a metal clamp fastened to a metallic rod and socket, which is in turn bolted to a long wooden pole, the cable conducting the current being flexible and connected to the metal clamp of the carbon terminal. The steel to be cut is connected to the other conductor from the alternating current circuit.

This method of steel burning solves the most important and perplexing problem of cutting steel of varying thicknesses and in most awkward positions with neatness and at very low cost per foot. Without doubt there are many places where this method can be applied to advantage by engineers and contractors, now that this demonstration has shown it to be successful in every way.

New Mail Box.

The postoffice department has approved a mail box for use on rural free delivery routes that will be of great help to carriers. The box is located on the end of a pivoted bar, so that the carrier, by reaching out a hook, can draw the box into the vehicle, removing letters or depositing mail, all without leaving his seat. When released, the box returns automatically to its normal position. If there is mail in the box, the carrier places the bar at right angles to the road, so that the owner can tell from a distance if letters are waiting for him. If the box is given a swing so as to be parallel to the road, it indicates that the box is empty. It is thought that these advantages will recommend it to the public generally.

A Safe Explosive.

It seems an anomaly to say that a substance can at once be an explosive and yet be safe. As a matter of fact, there is no such thing as a completely safe explosive, although the claim is made for many recently exploited substances. There is no explosive known which, under any conceivable circumstances, might not ignite gas or dust, or a mixture of gas and dust. But the relative safety of the very best and highest class of explosives, as compared with gunpowder, is so great that the difference of safety in degree practically becomes a difference in kind.

The latest of these substances is called bobbinite, and is classed as a non-detonating mechanical mixture which consists of a high-grade gunpowder containing but little sulphur, mixed with starch and paraffin wax. and compressed into a pellet coated with paraffin wax. It has been tested in various ways, and practical experiments in mining coal showed that it has marked advantages over other explosives.

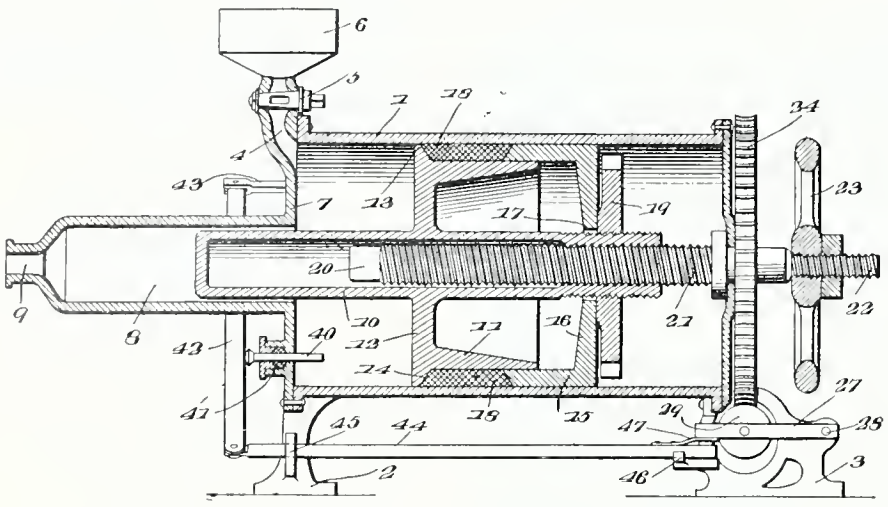
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CLEVER NEW PATENTS.

FORCE FEED LUBRICATOR.—FRUIT GRADER.—COTTON PICKER.

Force Feed Lubricator.

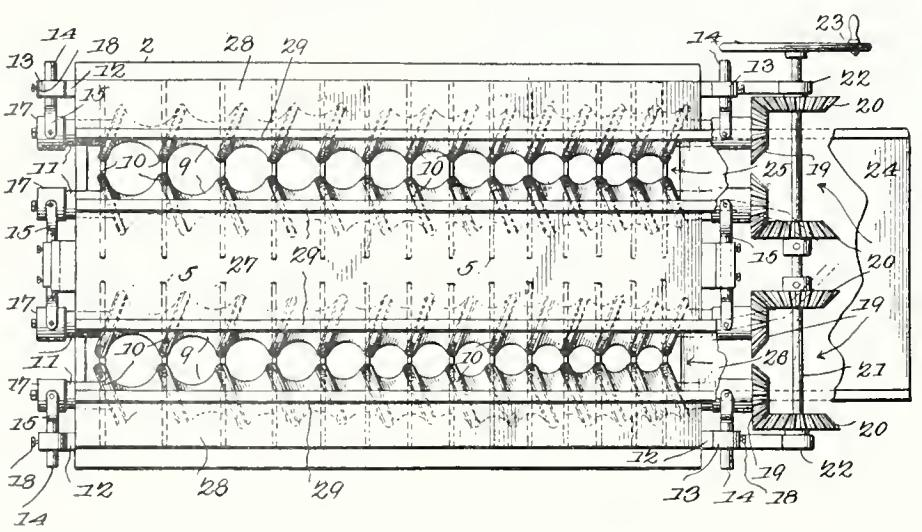
A new lubricator has been devised and patented by Mr. Joseph Hanson, of Inwood, Iowa. It has for its object to provide an improved force feed lubricator, the feed mechanism of which is arranged for intermittent operation by some moving part of the machine to which the device is applied. A cylindrical casing 1 is employed, having an upper feed hopper 6 controlled by a turning



valve 5, and having at one end a discharge spout 8 terminating in a neck 9 through which the service pipe for carrying the lubricant to the different parts of the machine is attached. In the cylinder 1 is employed a reciprocatory plunger or piston comprising sections 12 and 15, having a packing gasket 18 between them. This piston has a projection that operates in the spout 8, and a large shank 21, rotatably mounted in one end of the cylinder, is screwed into the piston and operates in the projection 10. Thus, upon the rotation of the shank, it will be evident that the piston will be moved back and forth in the cylinder. During the filling operation, it is moved by hand, and therefore a hand wheel 23 is provided at the exposed end of the shank. For effecting the expelled operation of the piston, a worm wheel 24 is secured to the shank, and a driving worm 29 co-operates therewith to turn it. This driving worm is mounted on a downwardly swinging arm 27 normally held in elevated position by a shifting rod 44. The rod is connected at one end to a swinging link 42, located in the path of movement of a pin 40 that projects into the cylinder. In operation, after the cylinder has been filled, the piston will be moved toward the discharge spout 8, and as it reaches the adjacent end, it will strike the pin 40. This pin 40 being moved outwardly, will swing the link 42 and shift the rod 44 until the end of the rod is moved from beneath the arm 27, whereupon the arm will drop and the worm 29 will disengage from the worm wheel 24, stopping the operation of the lubricator.

Fruit Grader.

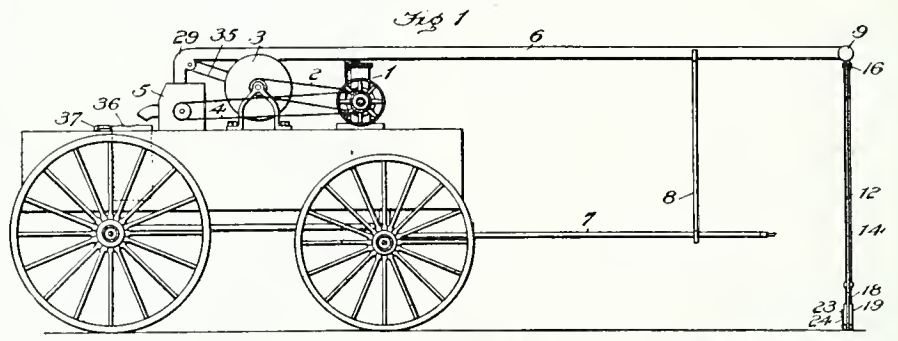
A simple machine for quickly and accurately assorting fruit is the patented invention of Mr. Edward N. Maull, of Crescent City, Fla. It is designed to facilitate the operation and increase the capacity of such machines, and to provide for the convenient adjustment of the co-operating assorting elements, particularly to separate the same for dislodging fruit which may become wedged between the assorting elements. The machine consists of sets of parallel rollers 11, geared to a common driving shaft 21 located at one end of the machine. The rollers of each set are respectively provided with right and

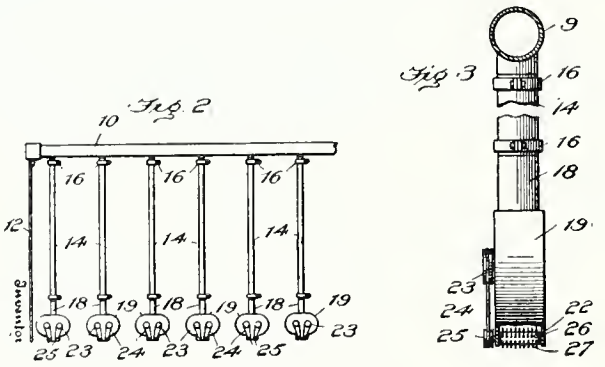


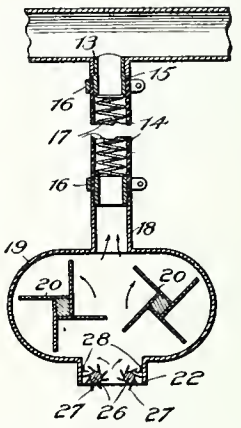
left spiral grooves that increase in depth from one end of the set to the other, thus providing a series of openings between the rollers that increase in size. Beneath the rollers are outwardly inclined delivery boards and partitions that divide the different spaces. In using the machine, the articles to be graded are fed into the end having the smaller openings, and as the rollers are rotated, said articles are moved toward the opposite end, and ride upon the rollers until they reach an opening through which they can pass. The articles drop downwardly between the rollers and into the corresponding compartment formed by the adjacent canvas bottom and the adjacent partitions.

Cotton Picker.

A novel machine for picking cotton is now proposed, the inventor thereof being Mr. Stephen A. Ellis, of Woodlawn, Ala., who has secured a patent thereon, and assigned a one-half interest in his patent to Mr. W. B. Copeland, of Birmingham, Ala. The mechanism, as shown, is mounted on an ordinary wagon body, and comprises a gin 5, a fan 3, and a suitable engine or motor 1 for directing both the fan and the gin. A conveyor conduit 6 extending in front of the wagon is supported from the tongue 7 by a standard 8 and is connected to the fan and delivers to the gin 5, its front end communicating with a cross pipe 9 from which picker tubes 14 depend. These picker tubes include flexible sections that are held against collapsing by internal spiral springs 17, and their lower ends have casings 19 attached thereto. In the casings are rotatable fans 20 having shafts that extend outside the casings, the projecting ends being provided with pulleys 23. Belts 24, passing about the pulleys, are engaged with other pulleys 25 connected to rotatable picking devices 26 arranged in the mouths of the casings. With this construction, when the fan is in operation, the indraft of air through the casings 19 will cause the fan 20 to rotate, thus rotating the picking devices. These devices are directed to the







different cotton bolls, and they will withdraw the cotton therefrom. The picked cotton is then drawn through the tubes and delivered into the gin, the lint being in turn delivered into suitable sacks 36. By this construction, the inventor provides an improvement in cotton harvesting machinery, in which the cotton is gathered by suction and is conveyed to a gin where it is ginned and packed into bales or sacks, the machinery being mounted on a wagon adapted to be drawn by an ordinary team.

PATENTS

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

LEDERER v. FERRIS.

(Circuit Court, S. D. New York. November 19, 1906. 149 F. R. p. 250.)

COPYRIGHT—SUIT FOR INFRINGEMENT—DISTRICT OF SUIT.

The provision of section 1 of the federal judiciary act of March 3, 1887, (24 Stat. 552, c. 373 [U. S. Comp. St. 1901. p. 508]), that no suit shall be brought in any other district than that whereof the defendant is an inhabitant, does not apply to suits arising under the copyright laws, as to which section 11 of the judiciary act of September 24, 1789 (1 Stat. 78, c. 20), is still in force, and such a suit may be brought in any district in which the defendant can be found and served with process.

BULLOCK ELECTRIC MFG. CO. v. GENERAL ELECTRIC CO.

(Circuit Court of Appeals, Sixth Circuit. December 4, 1906. 149 F. R. p. 409.)

1. PATENTS—INVENTION—ARMATURE CORES

The Reist patent, No. 508,637, for an improvement in armature cores designed to secure ample ventilation by the use of metal separators between the sections of laminæ of which the core is built up, discloses merely a carrying forward of the idea of prior devices by the use of the same means changed only in form or degree which did not involve invention; it is also void for insufficiency of description of the separators in respect to their thickness, form, and composition to differentiate them from those of the prior art, being described in the specification merely as "thin" and of "metal."

2. SAME.

When the novelty of an invention consists in the dimensions or the material of the new thing devised, the patentee must specify the particular dimensions or the particular material his invention contemplates.

WEST DISINFECTING CO. et al. v. FRANK et al.

(Circuit Court of Appeals, Second Circuit. December 4, 1906. 149 F. R. p. 423.)

PATENTS—INFRINGEMENT—DESIGN FOR CASING FOR DISINFECTANT.

The Taussig design patent, No. 33,633, for a design for a casing for disinfecting apparatus is valid; the attractive appearance of the casing shown rendering it popular with users, notwithstanding original structural defects. Also, held infringed.

BENBOW-BRAMMER MFG. CO. v. RICHMOND CEDAR WORKS et al.

(Circuit Court, N. D. Illinois, E. D. November 22, 1906. 149 R. F. p. 430.)

PATENTS — INFRINGEMENT — MECHANICAL MOVEMENT.

The Schroeder patent, No. 535,465, claim 1, for means for operating washing machines as construed in prior adjudications, and limited by the prior art, held not infringed, on a motion for a preliminary injunction.

A. B. DICK CO. v. HENRY et al.

(Circuit Court, S. D. New Yory. January 11, 1907. 149 F. R. p. 424.)

1. PATENTS—CONTRIBUTORY INFRINGEMENT —INDUCING PURCHASER TO VIOLATE LICENSE RESTRICTION.

Complainant manufactured a patented duplicating machine known as the "rotary mimeograph," and sold the same subject to a license restriction that it might be used only with paper and ink and other supplies made by complainant. Defendants made a special ink designed for use on such machine and similar ones and with the knowledge of such restriction sold the same to the owner of one of complainant's machines for use thereon, advising that it be placed in one of complainant's bottles. Held, that defendants were chargeable with contributory infringement of the patent.

2. SAME—SUIT FOR INFRINGEMENT—EQUITY JURISDICTION.

The fact that a complainant which made and sold a patented machine subject to a license restriction that it should be used only with ink made by complainant, requested a purchaser of one of its machines to give defendants an opportunity to sell her ink for use thereon, does not relieve defendants from the charge of contributory infringement where they made such sale with full knowledge of the license restriction, and for the purpose of inducing and procuring its violation by the purchaser; nor does the fact that complainant suffered no damages preclude it from maintaining a suit in equity to enjoin such infringement.

HARDER et al. v. UNITED STATES STEEL PILING CO.

(Circuit Court, N. D. Illinois, E. D. November 22, 1906. 149 F. R. p. 434.)

1. PATENTS— INVENTION — FEATURES NOT CLAIMED.

A patent for a metal piling made in interlocking sections cannot be sustained alone because the form of the sections and interlocking parts is such that they be rolled from steel, whereas those of the prior art, while similar in principle of operation, could not be so made, where the patent does not claim such advantage nor mention the material or method of making, and the device has never been manufactured or entered into commercial use.

2. SAME—INFRINGEMENT—SHEET PILING.

The Harder patent, No. 771,426, for a sectional sheet piling, construed, and, in view of its limitation by the prior art, held not infringed.

CALCULAGRAPH CO. v. AUTOMATIC TIME STAMP CO.

(Circuit Court, S. D. New York. October 23, 1906. 149 F. R. p. 426.)

PATENT—SUIT FOR INFRINGEMENT — PRELIMINARY INJUNCTION.

An application to a Circuit Court for a preliminary injunction to restrain infringement of a patent will not be granted, where it has been adjudged by a Circuit Court of Appeals of another circuit, after full consideration and upon substantially the same record, that defendant's device does not infringe. If the record on such application contains important new matter, the court will exercise its own judgment on the whole record.

WESTINGHOUSE ELECTRIC & MFG. CO. v. CUTTER ELECTRICAL & MFG. CO.

(Circuit Court, E. D. Pennsylvania. December 5, 1906. R. F. p. 437.)

PATENTS—SUIT FOR INFRINGEMENT—PRELIMINARY INJUNCTION.

A preliminary injunction to restrain infringement of the Wright & Aalborg patent, No. 633,772, for an automatic circuit breaker, denied, on the ground that, under the evidence and the construction placed on the patent in prior litigation between the parties, infringement by defendant's new device was doubtful.

KEASBEY & MATTISON CO. v. AMERICAN MAGNESIA & COVERING CO.

(Circuit Court, E. D. Pennsylvania. November 26, 1906. 149 F. R. p. 439.)

COSTS—PATENT SUITS—EXPENSE OF PRINTING EXHIBITS.

The expense of printing exhibits in a patent case is not a taxable disbursement, in the absence of a rule of court making it so.

UNITED SHIRT & COLLAR CO. et al. v. BEATTIE et al.

(Circuit Court of Appeals, Second Circuit. October 18, 1900. On Rehearing, January 30, 1907. 149 F. R. p. 736.)

1. PATENTS—ANTICIPATION.

A patent for a successful machine is not void for anticipation, because a prior machine intended for a different purpose may possibly be capable of use as an inefficient substitute for the latter machine.

2. SAME—INVENTION.

The conversion of an abandoned machine, which was a failure, into one which is operative and successful, by the introduction of new and ingenious features, however simple, constitutes invention, which may be protected by a patent.

3. SAME— ANTICIPATION — SUFFICIENCY OF PROOF.

A patent will not be held void for anticipation by an unpatented machine on the oral testimony of witnesses, the accuracy of which depends upon their unaided recollection of events which occurred 25 years previously, unless it is exceptionally clear and convincing.

4. SAME—PERSONS ENTITLED TO PATENT AS INVENTORS.

The right of one who conceives an invention to patent the same as the sole inventor is not lost because he lacks the mechanical skill to embody his invention in a machine, and employs another to construct such machine.

5. SAME—INFRINGEMENT — SUFFICIENCY OF PROOF.

A decree for infringement of a patent will not be reversed on appeal, because the proof shows that the infringing machine was sold by a concern doing business under a different name and style from that of the partnership of defendants as alleged in the bill, where it also fairly shows that the defendants were the proprietors of such concern, and the fact that they made the sale was not contested in the trial court.

6. SAME—INVENTION AND INFRINGEMENT—FOLDING MACHINE.

The Pine patent, No. 645,871, for a machine for folding the edges of blanks for making cuffs, collars, and like articles, was not anticipated in the prior art, and covers a true combination, although of old elements, which discloses invention; also held valid as against the claim that the patentee was not the inventor, and infringed as to the first four claims.

AMERICAN CARAMEL CO. v. THOMAS MILLS & BROS.

(Circuit Court of Appeals, Third Circuit. December 3, 1906. 149 F. R. p. 743.)

1. PATENTS—INVENTION—TESTS.

While utility is not necessarily a test of invention, it may help to determine the question, increased efficiency being accepted as an important factor, and it is also regarded as significant that there has been a recognized need of such a machine as that of the patent, and that the efforts of others to meet it have been without success which the patentee has attained only after continued experiment.

2. SAME—PRIOR PUBLIC USE.

A patent is not invalidated because a machine like that of the patent was made and used by the patentee more than two years before the application was filed, where such use was for the purpose of experiment only, nor is such use a public use, which will defeat the patent, because the product of the machine during the time was sold.

3. SAME—INVENTION AND INFRINGEMENT—CANDY CUTTING MACHINE.

The Hershey patent, No. 532,554, for a machine for cutting candy, covers a combination which was new, although the elements were old, and discloses patentable invention; the machine being of greater efficiency than any of the several which preceded it in the art. Also held valid as against the claim of prior public use, and infringed.

STUART v. AUGER & SIMON SILK DYEING CO.

(Circuit Court of Appeals, Third Circuit. January 11, 1907. 149 F. R. p. 748.)

PATENTS—ANTICIPATION-PROCESS AND MACHINE FOR LUSTERING SILK.

The Stuart patents, No. 705,715, for a process of intensifying the luster of silk fiber, and No. 705,716, for a machine for carrying out such process, are both void; the former for anticipation by the Hendrie British patent, No. 10,938 of 1845, and the latter for anticipation by the Brizon French machine, from which that of the patent was copied, and for lack of patentable novelty, in view of the prior art.

THOMAS et al. v. ST. LOUIS & S. F. R. COMPANY.

(Circuit Court of Appeals, Sixth Circuit. January 8, 1907. 149 F. R. p. 753.)

1. PATENTS—ACTION FOR INFRINGEMENT—DEMURRER.

The question of the validity of a patent on its face may be raised by demurrer in an action at law for its infringement.

2. SAME—NOVELTY—CAR TRUSS.

The Thomas patent, No. 570,148, for a lateral support for the sides and ends of cars, consisting of truss rods extending from the stakes on the outer sides and ends of the car to a plate beneath the car, is void on its face for lack of patentable novelty.

NEW YORK BELTING & P. CO., Ltd. et al. v. SIERER et al.

(Circuit Court, S. D. New York. January 14, 1907. 149 F. R. p. 756.)

1. PATENTS—INVENTION— SUBSTITUTION OF MATERIALS.

It is not invention to substitute rubber for an unyielding material in the construction of interlocking tiles for floors, walls, or the decks of ships, to enable the covering to respond to strains more quickly, readily, and safely; such result being due solely to the elasticity and resiliency of the material, which is a well-known quality of rubber.

2. SAME—TILE FLOORS.

The Furness & Watts patent, No. 527,961, for a tiled floor or wall composed of a series of tiles of yielding material having interlocking tongues and being removable, is void for lack of patentable invention in view of the prior art, which shows interlocking tiles of wood or stone, tiles of rubber not interlocking, and also a covering for floors, the decks of ships, etc., made of rubber in interlocking sections.

QUEEN & CO. v. R. FRIEDLANDER & CO. et al.

(Circuit Court, N. D. Illinois, E. D. January 16, 1906. 149 F. R. p. 771.)

PATENTS—VALIDITY AND INFRINGEMENT—VACUUM TUBES.

The Sayer patent, No. 594,036, for an improvement in vacuum or X-ray tubes, designed to automatically regulate the pressure therein (claim 1), which covers, "as a means for varying the pressure in a high-vacuum tube, a main circuit for operating the tube and a shunt-circuit for varying the pressure," is for a function only of well-known means, and is void. Claim 2 and 3 held not anticipated, valid, and infringed.

KAMPFE et al. v. J. R. TORREY RAZOR COMPANY.

(Circuit Court, D. Massachusetts. January 11, 1907. 148 F. R. p. 778.)

PATENTS — CONSTRUCTION OF CLAIMS—SAFETY RAZOR.

The Kampfe patent, No. 672,984, for a safety razor, claim 7, although a hinge is not mentioned therein, must be limited to a razor having a hinged casing, when read in connection with the specification, which makes the hinged top a principal feature of the invention, and the drawings in all of which the hinge is shown.

BLAMIRE v. SHELDON AXLE WORKS.

(Circuit Court, M. D. Pennsylvania. January 10, 1907. 149 F. R. p. 780.)

PATENTS — INFRINGEMENT — MACHINE FOR TURNING CRANKED AXLES

The Blamire patent, No. 663,325, for a machine for turning cranked axles, whatever the real invention, does not cover broadly the general combination of a slotted sleeve and chuck, but only the particular form of it therein described and claimed, and is not infringed by a machine which, while the general equivalent of that of the patent, doing the same work by substantially the same means and in much the same way, is yet materially different in mechanical structure.

LACROIX v. TYEBERG.

(Circuit Court, S. D. New York. November 12, 1906. 149 F. R. p. 782.)

PATENTS—CONTESTS—DEPOSITIONS.

The rule of practice in the federal courts in equity causes, whereby all irrelevant or immaterial matter offered by either side must be admitted to the record, has not been adopted by the Patent Office; but, on the taking of depositions to be used in a contested case before such office, a witness will be required to answer questions where the testimony may, on one theory of the case, be relevant.

YALE & TOWNE MFG. CO. v. ALDER.

(Circuit Court, E. D. New York. December 17, 1906. 149 F. R. p. 783.)

TRADE-MARKS AND TRADE-NAMES—UNFAIR COMPETITION—IMITATION OF LOCKS.

Complainant manufactured a padlock having a brass colored shackle and in a depressed panel on one side the word "Yale" in large letters and on the other side in another panel a trefoil symbol. Defendant, who was also a manufacturer of locks, copied the exterior form and appearance of complainant's lock for a mechanism of his own; the two being similar in appearance except that defendant's had the word "Yap" in one panel, and a keystone on the reverse side. Each contained the name of the maker in small letters on the shackle and the boxes in which they were sold to dealers, each containing a half dozen locks, were dissimilar in appearance. Held, that the resemblances were not such as were calculated to deceive ordinarily intelligent purchasers, and that, in the absence of proof of such actual deception, defendant was not chargeable with unfair competition.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

James B. Proskovec, Jr., Bruno, Neh. Listed Corn Cultivator.—The present invention which relates to improvements in listed corn cultivators, is adapted to cut down the hanks hetween the rows of corn, and is capahle of cutting stalks, roots and clods into small pieces, and to cut down all kinds of injurious weeds and plants. It is provided with means for loosening the soil of the hank to enahle it to hold water, for the douhle purpose of preventing the hank from becoming dry and the corn from being washed out. The cultivator is provided with a laterally adjustable set of knives located at different elevations and arranged to cut down a bank and clear the same of plants and weeds, said set heing composed of upper, lower and intermediate knives arranged at an angle, the lower knife having its outer portion hent outwardly, and the outer portion of the intermediate knife heing extended in the opposite direction.

Walter A. Douglass, Pilot Mountain, N. C. Comhined Fire Place and Stove.—It is the aim of this invention to provide a comhined fire place and stove adapted to he arranged either within a fire place, or to he connected with a chimney in the same manner as in an ordinary stove or heater. For controlling the draft, it has a blower adapted to cover more or less of the front of the comhined fire place and stove, accordingly as it is desired to make the fire hurn fast or slow. The invention comprises opposite sides, and a curved top connecting the sides, a hack composed of a straight bottom section and a separate upper section howed and extended upwardly and forwardly from the top of the lower section, and having its upper portion arranged adjacent to, and spaced from, the top to provide a narrow smoke passage or flue.

Washington B. Rose, Kingston, Tenn. Churn. — The device of this patent enahles a plurality of churn dashers to be simultaneously operated for churning in a plurality of churn bodies or receptacles, and it is equipped with a system of springs arranged to he operated successively to assist hoth the up-and-down movements of the churn dasher. It embraces a pair of churn bodies having dashers, a plurality of cross heads guided in ways and connected with the dashers, a pair of four-throw crank shafts having crank hends, flexihle connections extending from the crank hends to the cross heads, and springs connected with the ends of the cross heads. The crank shafts are simultaneously rotated by gearing.

John D. Henson, Bellefontaine, O. Curtain Fixture Support.—This is prohably one of the simplest devices of this character ever patented. It is intended for supporting both window shade rollers and curtain poles. It is formed from a single piece of wire, and comprises an upper threaded fastening terminal, the wire adjacent thereto heing hent into a roller-supporting hracket. An eye is formed at the lower end of the wire for the reception of a fastening device, and the wire adjacent to this eye is hent into a pole-holding bracket. An integral rearwardly looped connecting portion is provided hetween the roller supporting bracket and the pole bracket. The rear portion of this loop is arranged to ahut against the window frame between the fastenings, and thus constitutes an intermediate brace for the fixture.

Crawford D. Logan, Coal Hill, Ark., inventor. Two patents. Buggy Bow and Nut Lock. Henry T. Hackney, Coal Hill, Ark., assignee of the first patent; Joseph R. Brown and David M. Hunt, Coal Hill, Ark., assignees of the second patent.—It is the aim of the first patent to provide a device adapted to be readily applied to a huggy and capahle of cushioning a huggy top, and of preventing the bows thereof from hreaking. It comprises a hase having an opening to receive a rail holt, and provided in advance and in rear of the same with guide openings, a how-receiving support provided with spaced seats and having an intermediate connecting portion or har located helow the plane of the upper faces of the seats and provided with a slot; arms depending from the seats and slidahle through the guide openings of the base and having means at their lower ends for engaging the hase; springs disposed on the arms and interposed hetween the how-receiving support and the hase for cushioning the said support, and a strap arranged in the slot for retaining a how in the said seats.

The nut lock of the second patent is designed particularly for use in rail joints, and is adapted to securely lock a nut against accidental rotation, and is capahle of enahling a nut to he readily rotated by a wrench for screwing the nut on or off a holt. The device comprises a nut provided with a cylindrical extension having an annular groove and provided with peripheral notches, and a locking device composed of resilient sides pivoted at their inner ends to the extension and arranged to engage either the groove or the notches to prevent the locking device from swinging inwardly or outwardly, and a connecting portion located at the ends of the sides and arranged to engage a stop for locking the nut against rotary movement.

John Renner, Burlington, Iowa. Two patents. Window Shade Holder and Ball Bearing Window Shade Adjuster.—The shade holder of the first patent is adapted to he easily applied to a window, and is capable of readily receiving the ordinary window shade, and of permitting the same to he vertically adjusted, whereby the window shade may he arranged to cover any portion of a window to afford light and ventilation at the top, as well as at the hottom. The holder consists of hrackets adapted to support a window shade, a curtain cord, guides for the curtain cord, one of the guides heing constructed of a single piece of metal coiled at intervals to form spaced inner, outer and intermediate guide eyes for the curtain cord, the inner and outer eyes being vertical and arranged in longitudinal and transverse planes, and the intermediate eye being disposed horizontally.

It is the aim of the second patent to improve the construction of shade fixtures, and to provide a hall hearing window shade adjuster adapted to permit a window shade or curtain to he readily applied to the spring roller of an ordinary window shade or curtain, and it is also capahle of enahling the same to he arranged over the desired portion of a window, and of supporting a lace curtain rod, so that the lace curtains will not interfere with the adjustment of the window shade. It consists of a bracket adapted to support one end of a curtain roller, a pivoted cam mounted on the hracket for engaging the journal, which is connected with the spring of the curtain roller, said cam having a slot or opening for enahling it to he engaged hy a tool, and means carried hy the hracket and co-operating with the cam for holding the journal.

George W. Hahn, Indianapolis, Ind. Two patents. Horse Collars.—The first patent covers a horse collar capahle of adjustment hoth laterally and longitudinally to vary its width and length to enable it to fit the neck of the animal to which it is applied, and to avoid ruhbing and chafing the same. The collar comprises sides, means for detachahly connecting the sides together at the hottom, angular hars adjustahly and detachahly connected to the sides at the top, and a transverse member consisting of a single piece located heneath and adjustahly pivoted to the contiguous ends of said hars, thereby forming hinge joints on which the sides are adapted to swing in opening and closing the collar.

The device of the second patent relates to a horse collar adapted to dispense with hames and adapted to be conveniently repaired when necessary, and which will not ruh or pull loose. The collar of this patent emhodies thin metallic sides forming a complete front for the collar, complete side pads having inner and outer flexible walls and provided at their side edges with seams, the inner walls of the pads heing fitted against the inner faces of the metallic sides, and means, independent of the seams of the side pads, for securing the latter to the metallic sides, whereby the side pads are adapted to he removed therefrom without separating the walls of the said pads.

Joseph O. Beazley, Baltimore, Md. Faucet.—This patent is directed to a faucet, designed for use on supply pipes, and adapted to close automatically when released, without the use of springs, and without depending upon the pressure of the water or other fluid. It includes a body having a valve seat, a valve arranged to engage the seat at the pressure side thereof, a horizontal shaft mounted on the hody at the opposite side of the valve seat and connected with the valve, an upwardly extending weighted arm connected with the shaft at one end and arranged at an inclination when the valve is open, wherehy it is adapted to close the valve automatically, and stops arranged on the body in the path of the arm for limiting the movement thereof in opening and closing.

Taylor Puryear, Joneshoro, Ark. Shirt Sleeve.—The shirt sleeve of this patent is designed for use on outing and other shirts, and is capahle of being rolled up to a short distance of, and at a point below, the elhow to afford free use of the arm for playing such games as golf, or for any other purpose. The sleeve when rolled or turned up will remain in that position, and when turned down is adapted to receive a cuff, which can he adjusted to suit the length of the sleeve of the coat. The sleeve has a foldable lower portion having means for enabling it to be successfully folded or rolled up to shorten it, and a stiffening piece of a length less than the width of the sleeve to avoid interfering with the flexible character thereof, said stiffening piece forming a guide for folding the sleeve.

George H. Brown, Norfolk, Va. Two patents. Machines for Making Veneer Stave Barrels, and Ventilated Barrels.—The first patent relates to the construction of harrel forming machines, and its ohject is to provide one adapted to enable a barrel, keg, or similar approximately cylindrical receptacles, to he rapidly constructed of veneer staves, and capahle of dispensing with the rotary form usually employed in such machines, and of enabling the harrel or partially formed barrel to he rotated until completed. The barrel machine embodies fixed concave hoop-receiving surfaces, a movahle member provided with means for directly engaging a stave to partially rotate an unfinished barrel, a lever connected with the said memher for moving the same in one direction, and automatically operahle means for moving the said memher in the opposite direction to return the same to its initial position.

The barrel of the second patent is easily constructed, and has ventilating openings so arranged that they will not become clogged or closed by the contents of the harrel. This barrel is designed particularly for shipping garden produce, as it permits the ready escape of sweat and moisture. It comprises inner and outer staves having intervening spaces between them, the outer staves being provided with central ventilating openings, and the inner staves heing arranged to cover the intervening spaces hetween the outer staves, and having their intervening spaces located at the ventilating openings and forming grooves or ducts, which extend upwardly and downwardly from the ventilating openings.

Tilghman E. Branson, Belle Plaine, Kan., inventor; Harry Hatfield and W. S. Foster, Belle Plaine, Kan., assignees. Two patents. Grain Doors for Cars and Pneumatic Lifting Means for Grain Doors.—The first patent is directed to a grain door for cars, and provides means for enahling the doors of loaded cars to be easily lifted without the use of crowbars, levers, and other tools tending to destroy or otherwise injure a grain door, and therehy facilitate the preservation of the latter, and at the same time prevent leaks, and effect a great saving in time. When not in use the door operating mechanism is entirely out of the way, and it can he operated from the exterior for partially opening the grain door to relieve the latter of the pressure of the grain. It comprises a vertically movahle door, means for partially raising the same, said means embodying a vertically movahle support, which engages beneath the door when the latter is in its lowered position and carries the door to its raised position, said support heing separahle from the door so as to permit the door to have a continued independent movement after the partial raising of the door has been effected, and when the support has dropped hack to its normal position at the hottom of the car, and a guide for retaining the support in sliding engagement with the door frame.

The object of the second invention is to enahle the grain door to he readily started and partially opened by compressed air to relieve it of pressure. In this construction the hoisting mechanism is arranged normally in position for engaging the door to partially open the same, and has a detachable connection with the door, to permit the latter to have a continued independent movement after the hoisting mechanism has raised the door and dropped back to its normal position.

George W. Lovejoy, Tehachapi, Cal., inventor; Leo Harris, assignee, Tehachapi, Cal. Wheel.—The present invention relates to a wheel, designed particularly for use on plows, and adapted to hold a quantity of oil for lubricating the axle, and capable of excluding dust and dirt from the bearing, and of effectually preventing the oil from escaping. The wheel emhodies an axle box closed at one end and threaded at the other, an axle having a hollow spindle open at one end and provided with an intermediate lateral outlet, said axle heing also provided with a shank having a longitudinal oil hole or passage communicating with the hollow spindle, an adjustahle gland or nut engaging the threaded end of the axle hox and having a tapered opening and provided with an interior shoulder, and a packing arranged within the tapered opening of the gland or nut and interposed between the latter and the axle.



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FOR SALE—U. S. or Canadian Patent, No. 862,710, dated August 6. 1907. Codville's Universal Can Opener. Opens round, square or oval, or those with key, of any size. Address, James Codville, Bella Bella, B. C., Canada. apr

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FOR SALE—U. S. Patent No. 853,616, dated May 14, 1907. Spring Seat Attachment. Attached to old or new wagon spring seats, making seat fit different widths of wagon beds. Springs on either inside or outside of bed. For sale cheap for cash if taken at once. Address, Elmer Anderson, R. F. D. No. 2, Tustin, Mich. apr

FOR SALE—Patent No. 863,092, dated August 13, 1907. The Samuel M. Renn Handy Cistern Screen and Filter. For full particulars call on or address, Simeon H. Maurer, Spencerville, Ind. apr

FOR SALE—Patent No. 866,682, dated September 24, 1907. Bottle. Cannot be refilled without detection. Will sell outright for reasonable offer. Address, George H. Powell, Gardner, Kansas. mar

FOR SALE or lease on royalty—Patent No. 763,590, dated June 28, 1904; also Canadian patent; Fruit Jar Wrench. Best there is. Make me an offer. Address, R. J. Berthoud, Swanton, Ohio. feb

FOR SALE—Patent No. 862,875, dated August 13, 1907. Shoestring Fastener. Will sell outright for a reasonable offer. Address, Henry Behrens, Oakdale, Pa. feb

FOR SALE—Patent No. 831,216, dated Sept. 18, 1906. Car Step. For cash $15,000 or royalty. For further particulars address the inventor, George W. Davis, Denton, Texas. feb

FOR SALE—U. S. Patent No. 794,241, dated July 11, 1905. Combined Sash Lift Holder and Lock. Real substitute for Window Sash Weights. Address, J. B. P. Michaud, Whitney, Ont. Canada. mar

FOR SALE—Patent No. 864,600 issued August 27, 1907. Also No. 108,518, issued Nov, 12, 1907. Improved Bedstead which is simple and durable. Will sell outright. Price and information—Address, E. Blacknell R. F. D. No. 1, Box 52, Ferris, Tex. mar

FOR SALE—Patent No. 865,403, issued Sept. 10, 1907. Refrigerator with ice box filter and water cooler. Completely isolated from provision chamber so that drinking water is entirely free from contamination. Great ice saver. Address, Wilfred Landry, 602 Soniat St., New Orleans, La. mar

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FOR SALE—Patent No. 833,032, dated October 9, 1906. Elevator. Useful for lowering and raising articles in cellar; also for unloading railroad cars, loading freight on ships, elevating ice from ice-house into wagons. Can be attached to delivery wagons. Will sell outright or on royalty. Address, Joseph J. Fischer, Belle Plaine. Minn. mar

FOR SALE—Combined Ironing Board and Wash Bench. New patent just out. A great labor saving device for every household. Want to correspond with manufacturers of articles in this line. A. Schedin, Moscow, Idaho. feb

FOR SALE—U. S. Patent No. 861,872, dated July 30, 1907. A ventilator that can be used on board of ships, as well as on private or public buildings. Address, Roderick Macdonald, Fletcher Street, Glace Bay, N. S., Canada. feb

FOR SALE—Patent No. 864,065, dated August 20, 1907. Green Corn Husker. This machine will husk and silk in one operation. No butting. Does not soil or mutilate corn. Will sell outright. For particulars address, Charles Bennett, Mount Morris, N. Y. feb

FOR SALE—Patent No. 863,831. Improvement in Bungs. A simple device permanently connected to kegs and barrels. Can be readily tapped without danger of injuring same. Will sell at first best offer. Address, C. J, Bender, Fergus Falls, Minn. feb

FOR SALE—Patent No. 865,773, dated Sept. 10, 1907. Automatic Pigeon Feed Hopper. A practical, economical, time and labor-saving device. The most satisfactory hopper on the market. Works automatically in opening and closing. Address, John R. Elliott, No. 811 Chestnut Street, Camden, N. J. feb

FOR SALE—Patent No. 860,794, dated July 23, 1907. Double shoulder strap, especially adapted for letter carriers, newsboys, bill distributers, sportsmen, etc. Equalizes the weight of load upon both shoulders. Will sell outright or part cash with royalty. Address, Frank A. Felts, Oneida, N. Y. feb

WANTED.

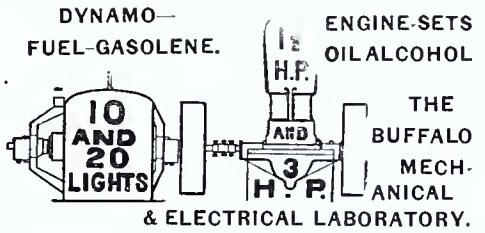
WANTED—Every carpenter in the U. S. to buy attachment to square. A useful device for all marking of frame work in one-fourth the time, without turning of timber. Sold by all hardware dealers. Manufactured by Storm Abram Burgett, Aurora, Ill. feb

WANTED—One vehicle wheel manufacturer in each state of the U. S. A. to manufacture my spring wheel, or would sell right to street railway. Patented Sept. 17, 1907, No. 866,192. For terms, address, L. J. Castian, Box 1366, Lethbridge, Alberta, Canada. mar

WANTED

TO APPOINT STATE MANAGERS.

to sell Steam Stump and Tree Pulling and Pile Driving Machinery, or sell my Stump Pulling Apparatus to a good manufacturing concern. Patent No. 852,411. Write R. L. Beasley, Gordon, Ala,, for terms.



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The Transmutation of the Elements.

Radium is as much of a wonder today as it was when the discovery of it startled the world. It has caused such amazement, that so far no adjective sufficiently descriptive has been found. And the new things that have been found out about it in the course of the eager investigations of science, are no less remarkable than the characteristics to which we have now grown accustomed. It glows in the dark; it is hotter than its surroundings at all times; it charges bodies electrically when they are near; it discharges bodies already charged with electricity; and it constantly gives off a gas called an "emanation," which goes through a number of changes, eventually forming helium.

Radium, it is generally admitted, is an element; for it has a definite atomic weight and a characteristic spectrum. Helium is also an element; if then, radium is transmuted into helium, the dream of alchemy has come true. This conclusion has been opposed by Lord Kelvin and other scientists, on the ground that if radium is an element, it should not break up into anything simpler than itself. But now comes evidence indicating actual transmutation of the elements.

It has been found that the emanation from radium during its change into helium gives out an enormous amount of energy—vastly greater than in any process previously known to man. To gain an idea of the amount of this power, the following comparisons have been made. A pound of pure coal, burned in oxygen, produces enough energy to lift its weight 2,000 miles; or say from New York to Venezuela. A pound of hydrogen burned under similar conditions (a most chemical reaction) generates heat enough to lift its weight 8,000 miles, or from New York to Honolulu. A similar quantity of radium, without any burning, produces enough energy to lift itself to the orbit of Neptune, or thirty times the distance from the earth to the sun. The decomposition of the emanation produces by far the greater portion of this energy. Surely such forces operating upon matter, says Dr. Baskerville in the New York *Times*, should cause events to come to pass with which man is unfamiliar. Indeed, he can scarcely foretell them, although Tyndall once said that "most molecules—probably all—are wrecked by intense heat, or in other words by intense vibratory motion, and many are wrecked by a very impure heat of the proper quality."

When the emanation is placed in a dry vessel, it breaks down into helium. Sir William Ramsay has just shown that when the emanation breaks down in the presence of water, neon—one of those five inert elements found by him in the air—is produced. When the emanation breaks down in a solution of blue vitriol or copper sulphate, argon is the lazy gas produced. One of these is five, and the other is ten times as heavy as helium. We should expect the argon and neon thus produced to continue breaking down until helium is obtained; and though no specific information on this point has yet been obtained, it is known that these elements obtained from other sources have not as yet been observed in such a temporary state.

The most remarkable part of Ramsay's observation, however, was concerned with the liquid left behind. When the copper was removed from the solution, lithium was detected in the residue. This was not the case when copper was removed from a similar solution before treatment with the emanation. Gold, silver, copper and lithium are members of one of the so-called chemical families. Lithium is the member with the least atomic weight, being one-ninth that of copper. Evidently, therefore, the powerful emanation brought about a degradation of the copper—or the element copper was transmuted into the element lithium.

Can this emanation be Bacon's "philosopher's stone" reversed? And is there any way of taking the abundant elements of comparatively low atomic weights—such as calcium from lime, aluminum from clay, or copper even, and so saturate them with energy that they may acquire properties like radium or platinum or gold?

Most writers on radium think such an accumulation of energy as shall be sufficient to build up that substance, impossible. Dr. Baskerville, however, is not so sure. A hundred years ago the telephone, with its present perfection, was a wild dream. Fifty years ago the communication of continent with continent was beyond comprehension. Fifteen years ago if any one had said we should soon be able to see the bony structure of the body through its fleshy covering and envelop of clothing, he would have been thought a fit and proper subject for an asylum. Yet we now have the X-rays. Many dreams have come true; but this is no reason for assuming that all the pictures a fertile imagination may draw are to become verities.

Safe Railway Travel.

There is no work that will meet with more popular approval than the movement to prevent disasters on railways. The list of the killed and maimed grows year by year, and the total number of casualties is enough to make the boldest pause. The United States has an unenviable reputation in European countries for the recklessness with which our railways are operated, and it is not without foundation; for the number of accidents is enormously greater than in England, for instance. Nor can this statement be answered by alleging the longer mileage in America, or the heavier traffic. As a matter of fact, the casualties on British railways are only one-fortieth of the aggregate from the same causes in this country; a startling statement. During twelve months that were taken for comparative purposes, only six persons were killed and 112 injured in collisions and derailments in England, while 715 were killed and 5,550 injured on this side of the water. It is therefore high time to take measures to prevent this wholesale slaughter, and the report to Congress of the experts appointed to examine into devices for the protection of railway passengers, will be read with wide interest.

The report deals with the various methods that have been adopted to prevent collisions, derailments and other prolific sources of accident, and particularly with the operation of the block signal systems. It appears that fifty of our chief railroads are now using the block system on their lines of heaviest traffic. and are extending it over their entire length. The general consensus of opinion is that it represents an improvement over other means of safety in train control, and that it can be installed without too heavy expense. Automatic signals are superseding telegraph signals to some extent, and this movement will probably become more accentuated in the near future. A number of roads show only one dangerous failure of apparatus in a record of millions of signals. Automatic stops, it has also been found, act independently of the engineer and bring the train to a standstill before it reaches the danger point, when the driver has failed to do so. This system has been used on the New York subway and on the Boston elevated, with good results.

None of these methods, of course, is absolutely faultless, and serious accidents occur even with the block system—as was illustrated in the collision on the B. & O. about a year ago, in which over forty passengers were killed. The recommendation is therefore made that railways should provide against the possible deficiencies of this system by continuing train dispatching regulations which were in use before it was adopted, and by requiring flagmen to go back over the track when a train is detained between stations, in order to stop trains that may have wrongfully passed block signals. The system has reduced the number and cost of collisions, and while the commission was preparing its report, there were nine terrible accidents which the adoption of automatic signals might have prevented.

The Interstate Commerce Commission has, during the past year, been making tests of devices for the automatic control of trains and for otherwise protecting the traveling public. Five hundred different appliances have been received from inventors all over the country, but more than half of these did not comply with the requirements. About 150 were rejected by the commission because they were mechanically defective, or impracticable; and a hundred are still under consideration. Three devices have been considered worthy of practical tests, and arrangements are being made for a trial of one of them on a road near Chicago. The experiments will cover several months, so as to find how the device will work under heavy and light traffic, and how weather conditions will affect it. It is an auxiliary to the block system, which will automatically control a train and stop it, if the engineer passes a danger signal.

In two other cases the inventors have already made installation at their own expense, with the assistance of railway companies, one in New York and the other on the Pacific Coast, where the apparatus is now in operation. The commission is going on with its investigations, and will try as many devices as are found practical. It is hoped that the inventive genius of this country will be able to equal the task of preventing the terrible sacrifice of life and limb that now threatens railway travel.

Wireless Telegraphy.

Wireless telegraphy appears to be settling down on a practical basis. It is finding its most important field, commercially, as a means of communication between ships at sea and between ships and the shore. How long it will hold this field undisputed depends upon the measure of success that may attend the efforts of those who are now trying to perfect wireless telephony. At least half a dozen inventors are at work on this problem, and it is said that the wireless transmission of speech has been successful in several places; but much remains to be done before it becomes commercially available. When it does, it will necessarily, to an extent, displace wireless telegraphy. For example, one of the chief reasons why the latter is not already universally installed on all sailing vessels and steamships, is the necessity of employing an expert Morse operator to transmit and receive messages. Wireless telephony, on the other hand, could obviously be installed to advantage on every vessel that floats, and perhaps on railway trains as well, for any purpose that may arise.

In this connection, it is interesting to note that an entirely new form of wireless telegraphy has been announced by a Dane, Mr. Poulsen, who has already won distinction in the field of invention. In wireless telegraphy, as we now know it, the condition of things may be simply and crudely explained by saying that the electric spark, occuring between two

highly charged bodies, gives rise to an electric ripple in the ether, as a stone dropped into a pool of water produces a ripple on the surface. Mr. Poulsen's invention, it is claimed, has sounded the death knell of spark telegraphy. The inventor likens his system to a tuning fork giving out steady and continuous vibrations, in sharp distinction to the series of explosions to which the spark form of electricity might be compared. He claims that by his system absolutely perfect tuning is possible, so that there can be no mixing up of messages intended for different persons, and also that unauthorized tapping of messages will be impossible.

Some recent experiments in the use of wireless telegraphy between railway trains in motion and fixed stations were made on sections of track about 12 miles long, with four stations within this distance. The outfit consisted of a filings coherer receiver and an induction coil transmitter, together with the usual apparatus. A car containing the outfit was equipped with a rectangular wire suspended by posts one foot high at each corner of the roof. The wire was attached to porcelain insulators on the top of these posts. A single wire was led from this wire to the apparatus within. A ground was obtained through the iron trucks of the car. The fixed station was between the telegraph poles. The aerial wire was erected horizontally between the poles and paralleled the regular telegraph wires for a distance of about 100 feet, being one foot therefrom and carefully insulated. The ground was made by a wire connection to the nearby rails. The maximum distance of the train from the tracks was 65 feet. Reliable signals were sent at a distance of seven and a half miles.

Lunches From the Slot Machine.

If there's anything you want, drop a nickel in the slot, and you will get it. That automatic salesman, the slot machine, has become universal, and provides us with chewing gum, peanuts, candy, photographs, music, a record of one's weight, as well as with such indispensable accessories to the toilet as pins, needles and collar buttons. Postage stamps may be acquired in the same way through government machines; and now the hurried and hungry public is to be fed by machinery. The apparatus that does the work is five feet high, and contains 24 small compartments or drawers, labeled according to contents. During the dull hours of the day the restaurant keeper, or whoever has charge of the machine, fills these drawers with a variety of assorted sandwiches, pies, etc.; and when the rush hour comes, all the purchaser has to do is to glance over the menu as printed on the drawers, drop a nickel—or a dime—into the slot, and press the button opposite the lunch of his choice. The drawer opens, and he gets his food. The machine has acquired great popularity in depots, parks, etc., as well as on steamboats and at the entrance to factories and similiar establishments where no restaurant is convenient.

In line with the above is the scheme of an enterprising dairy company of London, to furnish milk to customers. A brass spout projects from the door of each depot of the company, having attached to it a handle and a slot. You place a penny in the slot and turn the handle, and you get a glass of milk.

Steel in Flour.

Physicians are now claiming that since the introduction of roller flour, appendicitis has been on the increase. This is attributed to the quantity of steel that is ground off the rolls during the process of producing flour. These pieces of steel are infinitesimal in size, and a sack contains about a teaspoonful of the fine particles. A man in Kansas has secured a patent on a magnet to draw steel out of the flour, and there is talk of obliging the mills to remove the steel, or to install some process which will do away with the use of steel rollers.

Automatic Chain Machine.

An automatic chain making machine has been perfected by the manager of a Birmingham factory. The apparatus draws in a steel bar at one end and the latter issues at the other end in the form of a steel link chain completely assembled. In the process of manufacture none of the metal is lost, the weight of the chain when finished being exactly that of the metal before making. The machine is so contrived that the metal bar is pierced and the parts thus formed compose a flat link. Each perfected link comprises a joint consisting of a raised projection or lip at one end, having a convex outer surface of about a quarter of a circle, while at the other end the center portion is carried over to form about four-fifths of a circle, hitching over the lip end of the next link, an open space permitting detachment sideways.

New Street Car.

Millions of dollars will be saved the street car companies every year, it is claimed, by the adoption of a new type of car which is now being installed in Philadelphia. The car is known as the "pay as you enter," and it is believed that by its employment accidents as well as the loss of fares, of which every company complains, will be avoided.

The rear platform is from seven to nine feet long, and is fitted with an entrance and exit for passengers. The conductor stands at the door and collect fares as passengers enter. The platform accommodates between 25 and 30 passengers, and they enter the car through a door on the left side, while those leaving make use of a door on the right. An exit is also provided on the front platform, but passengers are not allowed to enter here.

It is thought that this car will save time in running, as passengers can begin to enter as soon as the car stops, without having to wait for others to get off. The inconvenience of having the conductor push his way through the car every few minutes, to collect fares, is also done away with. There will be no altercations between passengers and conductor as to fares having been paid. Accidents from premature starting are also prevented, as the conductor, being always at the rear of his car, can attend to the bell signals. There is a sliding step which works automatically when the car stops and starts. Passengers can board the car only when the step is in place.

Hot Air Fan.

A fan which is run by hot air instead of by electricity is described by our Consul at Bombay. Owing to the intense heat which prevails in India during most of the year, he says, fans of some kind are a necessity, and the new hot air contrivance is finding a sphere of usefulness where electricity is not available. It has been discovered, too, that it can compete with the electric fan in its own field, owing to the extreme cheapness of its operation, which is only about one-fifth that of the electric fan.

The new fan is propelled by a hot air engine, the heat being generated by a a kerosene lamp which holds about a quart of oil, sufficient to keep a fan running for 24 hours. To the lamp is attached a small glass chimney which fits into a larger metal chimney connected with the engine. Upon the top of the engine is hung the fan, similar in shape and size to the ordinary electric fan, whose speed is governed by the size of the flame; that is, to reduce the speed the flame is turned down, and to increase it the flame is turned up. The whole outfit weighs about 30 pounds, and rests upon a small stand, which raises the level of the fan proper to that of an ordinary desk. It is fitted with handles, and can be easily moved to any portion of the house.

Paper Yarn.

An account of the new material for weaving cloth appeared in the August INVENTIVE AGE, but such wide interest has been taken in the subject that the following additional particulars are given. Our Consul at Plauen, Saxony, where the new yarn is manufactured, says that while the term "paper yarn" describes the material in a popular way, the designation "wood yarn" is more exact. The yarn proper is cellulose fiber converted into flt strips of the desired thickness and width. These strips are then spun on specially constructed machines. It is not sought to obtain elasticity in paper yarn. Strength and flexibility are the objects in view. The new yarn is cheaper than that produced from shoddy or from cotton waste, which materials are further unadapted to the finer shades in dyeing, and unsuited to other purposes. A fabric of good paper yarn can be laundried again and again. An instance is cited of a piece of white drugget, made of paper yarn, placed before the door of a busy office and tramped upon for two years. It has been washed perhaps fifty times, and comes out white and strong, so that the period of its usefulness is by no means at an end.

Bagging of paper yarn can be used advantageously for packing sugar, coffee, salt, and other products susceptible to pungent odors. In this respect, the new material is superior to jute. It might be imagined that paper fabric would readily ignite, and that a lighted match falling on a paper rug would start a conflagration. It is declared, however, that a burning match will do more damage to a jute or even a woolen rug, and be more likely to lead to disastrous consequences. While not uninflammable, an ordinary rug of paper will burn with little more readiness than a wooden floor. For underwear it is especially adaptable, as it is cleanly and easily laundered; and caustic soap, instead of injuring it, makes the fabric softer.

The purposes to which paper yarn can be put are so diversified that it is difficult to describe its field of utility. It cannot be expected, says the consul, that it will appreciably decrease the output of other textiles, but on account of its relative cheapness it has claims of its own. Literally it is a new yarn. The commercial success already attained by its discovery demonstrates its practicability. Conservative German manufacturers consider it a highly welcome and well-nigh indispensable material for many textile purposes.

Cape Cod Canal.

This is the time of canal talk and canal construction. The Panama undertaking of course ranks first in importance, but hardly second to it in difficulty is the Russian enterprise of a Black Sea Baltic canal. The world has now nine great ship canals, all of which have been built in the last 75 years, and it is probable that before the century is closed, more than this number will be built, especially if there is the same congestion of railroad traffic that there has been of late. Florida is attempting a canal system from Jacksonville to Key West; New York has decided on a bond issue of $100,000,000 for the Erie Canal; and there are projects to connect New England, the Great Lakes and the Gulf, by water. A less ambitious plan, but one that will be welcomed by the traveling public, is to construct a canal across Cape Cod. The waters around Nantucket are notoriously rough, and have spoiled the pleasure of many a honeymoon trip. The coast of the great "fish-hook," too, has an evil reputation for danger and treachery. It is estimated that a quarter of all the wrecks that occur along the east shore of the country take place in this neighborhood. So it is welcome news to learn that the contract for the canal has been awarded, and that work will soon begin. It is a wonder that it has not been earlier undertaken, as the task presents no problems of difficulty, and the length will be only eight miles on land. Several miles more, however, must be dredged on either side of the peninsula. The canal will run from east to west, from near Grey Gables, the former summer home of President Cleveland, on Buzzards Bay, to Sandwich on Cape Cod Bay. The depth is to be 25 feet at low water, and the width from 100 to 200 feet. When it is recalled that 30,000 vessels go around Cape Cod every year, and that it takes about 15 hours to make the circuit, the importance of this enterprise to the shipping of this country will be appreciated.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies $1.50.—Please give correct data in ordering.—Address,

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Alarm apparatus.....L. W. Pennington
Album.....H. Uffner
Aluminium and other metals. Producing.....H. S. Blackmore
Amusement device.....C. C. Keen
Animal-trap.....A. Johnson
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Box for candy and other articles.P. R. Warren
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Railway cattle-guard.....E. A. Manny
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Railway-tie lifter.....J. W. Norton
Reamer.....F. W. Letsch
Receptacle-forming machine....G. W. Maxwell
Reel.....J. N. Landon
Refrigerator.....H. Johnson
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Resilient-tired wheel for self-propelled vehicles.....E. M. Carhart
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Book-mark.....H. M. Willis
Brooches, scarf-pins, or similar articles. Head for.....J. E. De Wyngaert

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Headlight.....R. H. Welles
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Grave-protector.....G. H. Knöehel
Gridiron.....A. C. Parry
Grinding-machine feed-regulator..A. T. Edison
Grinding or polishing wheel.....C. B. Wattles
Grooving and jointing machine cutter-head.....
.....H. B. Ross
Ground-plate.....B. J. Jones
Grout mixing and discharging apparatus. Pneumatic.....W. L. Canniff
Gun-case and ammunition-belt. Combined.....
.....N. T. Veliquette
Gun-sight.....G. H. Garrison et al
Hair-pin.....D. W. MeNeil
Hammock-support.....C. H. Banks
Harness-hanger.....F. Hof
Harvester. Beet-.....M. Goodfellow
Harvester-knotter.....R. H. Moore
Hat-fastener.....M. F. Laubach
Hat-holder.....R. W. Bock
Heel. Detachable.....C. C. Sehmidt
Hides and making same. Substance for treating.....O. H. Nowak
Hides and skins. Carroting..C. and E. Pichard
Hinge. Door-.....W. K. Henry
Hoeing-machine.....W. A. Harris
Hog catcher and holder.....J. Davis
Hoisting apparatus.....A. G. Monks
Hoof-parer.....J. Hedriek
Hook-rod-disconnecting device.....
.....D. K. Allison et al
Hop-jack.....O. Selg
Hop-wire-detaching device.....J. A. Grover
Horse-detacher.....P. A. Peterson et al
Horse-gaiting device.....E. A. Hyde
Horseshoe.....R. Hübner
Horsehoe.....H. J. Ross
Horseshoe-ealk.....E. Courtney et al
Hot-air furnace.....A. C. Mott
Hot-water boiler.....H. Wilson
Hub. Vehiele-.....A. Hart
Hydrometer testing-jar.....F. Storm
Iee-machine.....W. W. Tobey et al
Illusion device.....A. K. Massaad
Incubator.....J. E. Chambers
Index. Card-.....E. Eckart
Instep-support.....F. N. MeKinnon
Insulated rail-joint.....J. H. Brothers
Internal-combustion engine.....A. M. Brown
Internal-combustion engine....H. S. Anderson
Invalid-lifter.....G. E. Olsen et al
Iron from metallic sulfids. Making.....
.....R. H. Aiken
Jack or lifting device.....I. J. Lagasse et al
Joining device.....H. Pohlmann
Knife-polishing maehine.....G. S. Blakeslee
Knife-switch.....H. P. Ball
Ladder. Extension-.....W. Williamson
Lamp.....A. H. Handlan, Jr.
Lamp. Are-, 2 pats.....W. E. Daniels

Lamp-burner....W. A. Fain et al
Lamp. Gas-....E. W. Cornell
Lamp bolder. Electric-....C. E. Throop et al
Lamp-receptacle....J. S. Stewart
Lamp-sbade. Folding....V. Freytag
Last....H. F. Loewer
Last....J. P. Thurell
Lasting-machine....J. Cavanagh, Jr.
Latch. Door-....J. H. Stratton
Latch-book....E. A. Hill
Leatber. Manufacturing artificial....L. Gevaert-Naert
Lifting and moving jack. Combined....A. W. Whiteford
Linotype-machine....G. G. Babcock
Linotype-machine....C. T. Libby et al
Linotype-slug receiver....G. E. Wallin
Liquid-dispenser....J. Fitzpatrick
Loading jack. Lumber-....G. Rypkema
Lock....A. Cordeau
Lock....F. S. Aliano
Locomotive....N. D. Levin
Locomotive driving-boxes. Wedge for....W. J. Barrett
Log finder and lifter for submerged logs, &c....J. M. Munn
Looms. Lay-motion for....A. E. Rhoades
Looms. Rotary magazine for weft-replenishing....M. L. Stone
Looms. Wire head and fastening means for....F. Mitchell et al
Lubricator....W. and J. W. Leyland
Machine frame. Long-....W. D. Richter
Mail deliverer and receiver....O. Fisber
Mail-poucb receiving and delivering device....B. Stanley
Mail-receiver....A. F. Kuhl
Mantle holder. Welsbach-....C. R. Warner
Manure-spreader....S. K. Dennis et al
Manure-spreader....C. W. Smith
Marble. Making artificial....E. E. Hippe
Massage implement....H. D. Gardy
Measuring and cutting skirts. Machine or device to be used in....V. A. Phoebus
Measuring macbine. Cloth-..L. P. Normandin
Mechanical movement....L. Griffith
Messages, signals, &c. Apparatus for receiving and strengtbening tbe reproduction of....E. S. Hagemann
Metal hoop....J. E. Wright
Metals. Making a solution of rare-earth....C. Baskerville
Metallic chair....J. H. Petroskey
Metallic tie....W. D. Turner
Metcr....E. Schattner
Meters. Prepayment attachment for electricity-....F. J. Dowling
Micrometer-gages, &c. Spindle-lock for....L. S. Starrett et al
Microscope....E. Bausch
Microtome....H. Lebrun
Microtome....R. H. Pietzsch
Mixing fluids and molten metals of different densities. Device for....H. Leiser
Mixing-machine....W. G. Stockham et al
Mold attachment....H. A. and H. W. Keehn
Molding-machine....J. H. Koontz
Molding-machine....H. Pocock
Molding process....A. B. Marsteller
Monkey-wrench....C. and G. C. Van Horn
Mortar-mixer....C. E. Oelman
Motor....J. Schroeder
Motor control. Electric-....W. Cooper
Motor-control system....W. L. Merrill
Motor-control system....W. J. Richards
Motor-control system....W. F. Schneider
Motor control system. Electric-....L. M. Aspinwall
Motor controller. Electric-....W. A. Paris
Motor starting and controlling apparatus. Electric-....A. Taylor et al
Mounds, graves, and otber similar purposes. Cover for decorating....C. Weber-Illig
Mouse-trap....J. A. Vincent
Mower. Lawn-....T. J. Dunning
Mower. Lawn-....I. Ellwood
Music cornet. Automatic sheet-....C. E. Fauth et al
Music-playing instrument. Autopneumatic....W. R. Crippen
Music-sheet holder....F. W. Barrows
Musical instrument....J. A. Bartholomew
Musical-instrument keyboard...A. E. Adriance
Musical instrument. Mecbanical...F. G. Lynde
Newspapers and the like. Conveyer for....E. G. Thomas
Nozzle....F. W. Cummings et al
Nut. Axle-....N. H. Roe
Nut-lock....F. Greene
Nut-lock....A. H. Reade
Ores. Chloridizing....J. E. Greenawalt
Ores from the rocky constituents thereof. Apparatus for separating the metallic particles of....D. H. Norris
Ornamental article for personal wear....M. E. McDonnell
Oven. Portable....A. B. Kingsland
Overshoe....J. D. Price
Package-tie, 2 pats....O. S. White
Packing. Metallic....E. M. Cook
Pail and heater. Dinner-....E. F. Hayes
Paper box....G. R. Wyman
Paper coating or treating machine....H. P. Hilbert
Paper sacks and roll-paper. Combined holder for....W. E. Burks
Paper-softening apparatus....T. Scherf
Pencil-sbarpener....A. T. Peterson
Phonograpb....J. Bornand et al
Photograph cabinet or rack....J. N. Koch
Photograpbic flash-lamp....J. Inglis
Piano-sling....H. H. Hanson
Piling. Compressed-air-cusbion block for....C. C. De Witt
Pipe-bending machine....J. F. Cox
Pipe-threading machinery..E. D. Westrip et al
Pipe-wrench....J. L. Brown
Planers. Work-support for bottom cutter-heads of wood-....C. W. H. Blood et al
Planter. Corn-....C. E. Mentzer
Platen-gage....O. V. Stapp
Plow. Auto steam-....C. G. Hampton
Pneumatic-despatch apparatus...E. A. Fordyce
Pneumatic-despatch-tube apparatus....A. W. Pearsall
Pneumatic-despatch-tube apparatus. Terminal for....I. W. Litchfield
Pneumatic-tube-apparatus carrier....E. A. Fordyce
Pocket-knife....H. Berns
Pole. Sheet-metal....W. L. Wright
Polishing-machine....C. M. Nichols
Porch cleaner....M. Mueller
Postal mailing-card....D. W. Custer
Powdered substances. Receptacle for....Y. K. Buell
Power-transmission mechanism..J. H. Pendleton
Pressure. Machine for exerting..E. P. Guenther
Pressure-tank....G. Lewis et al
Printer's registering device....F. C. Dohrmann
Printing attachment for paper-roll holders....J. L. Lamboley
Printing-film frames. Film-frame rest for....B. Day
Printing-machine. Duplicating..B. O. Fanslow
Printing-machine. Platen....M. Rockstrob
Printing-press ink-distributing mechanism....G. W. Prouty
Propelling mechanism. Boat-...A. J. Fell et al
Pulp-screening apparatus..W. A. Stevenson et al
Pump....H. Wahler
Pump. Air-....G. H. Mohler
Pump. Centrifugal....P. J. Wickblom
Pump. Chain-....C. J. Williams
Pump. Combined wet and dry air....R. D. Tomlinson
Pump. Vapor-....H. A. Fleuss
Pumping-cylinder valve....M. A. Neeland
Punch. Paper-bag....R. Munday
Punching-bag hanger....E. K. Davis
Puncture-closer....D. Apstein
Puzzle....C. Hunt
Puzzle....M. O. Mertes
Race-course barrier and starting device....D. McGladdery et al
Rack....H. M. Manheim
Radiator, 2 pats....E. L. Ogle
Rail magnetic brake....V. L. Ochoa
Rail. Third....R. K. Eddowes
Rail-tie....L. R. Nordquist
Railway-switch....R. F. Gilmore et al
Railway-tie....L. Blessing
Railway-tie....W. H. Castle
Railway-tie....A. F. Gustafson
Railways. Automatic block-signaling system for electric....F. Townsend
Receptacle....J. A. Hoffmann
Refrigerators and alarm therefor. Receptacle for the drain-water of....A. Casale
Register....L. A. Schmidt
Register-hook....W. L. Hamilton
Rheostat....H. P. Ball
Riveting apparatus....B. Waddington
Rock-crusher....E. S. Philips
Rock-crusher. Multiple....E. S. Philips
Rocking-horse. Traveling....B. F. Fowler
Roll-holder....H. Thumann
Rolling apparatus....E. E. Slick
Rolling irregular shapes. Mill for..E. E. Slick
Rolling-mill....A. T. Keller
Roofing materials. Device for tying rolls of....F. S. Howard
Rotary engine....B. F. Augustine
Rotary engine, 2 pats....V. Pingret
Rotary engine....E. C. Rhodes
Rubber boot and shoe....T. Crowley
Rubber boot and shoe....T. E. Hurley
Rubber mat....T. P. Farmer
Rug-fastener....N. K. Davidyan
Saddletree-plate....J. E. L. Crawford
Safe. Provision-....O. E. Kearns
Safety-pin....L. C. Wicks
Sand-molding machine....W. C. Norcross
Saponification process....M. R. A. Samuel
Sash-cord holder....G. C. Smith
Sash-lock....C. Smith
Sash-lock....F. E. Greis
Sash-supporter....W. W. Sweetland
Sash. Window-....L. J. Cook
Saw....S. J. Gray et al
Saw-filing machine....I. H. Farrow
Sawing-machine. Self-feeding..J. A. Meeks et al
Sawmill set-works....P. J. Bogie et al
Scaffolding-bracket....G. E. Humphries
Scale. Platform-....M. H. Reed
Scraper. Disk-....W. E. Wilhelm
Screw-driver....C. H. Chappelle
Screw-driver. Magazine....L. S. Starrett
Screw-driver. Ratchet....B. F. Foss
Seal....A. B. Schofield
Seasoning-machine....F. F. Howe
Seeder and fertilizer-distributer...J. A. Ingram
Separating process and apparatus..W. E. Pearse
Separator....W. Baker
Settee. Gliding....I. C. Manahan
Sewing machine. Chain-stitch shoe-....H. A. Ballard
Sewing-machine edge-guide....J. Kosatka
Sewing-machine guide....I. Stuhlman
Shade-roller. Spring....A. John, Jr.
Shaft-coupling....J. J. Schmitt
Shears and other tool....J. M. Sweet
Sheet cutting and feeding mechanism. Variable-size-....H. M. Barber
Sheet-feeding mechanism....M. F. Mahoney
Sheet-marking mechanism....G. J. Gerhardt
Sheet-metal articles. Producing bollow....R. Chillingworth
Shelf-support system....E. W. Bryant
Shells. Loading short-range shot-....L. D. Christie
Shells. Scatter-load for shot-....L. D. Christie
Shoe-polishing device....H. W. Dedels
Show-case....D. M. Baldwin
Shuttle-motion....G. M. Von Culin
Sifter. Ash-....J. Irving, Jr.
Sight-feed lubricator....N. McCoy
Sign. Automatic display-....J. A. Viger
Silicids. Producing....E. F. Price
Skid....C. Sheley
Skirt. Maternity-....R. H. Peters
Skirt-supporter. Adjustaule....A. Cleeves
Sled-brake....G. S. Gudmundson
Sleigh. Motor-....A. Luchinger
Slicing-machine....F. D. Prettyman
Smoke-preventing apparatus....J. P. Davis
Snap-fastener....G. A. Holmes
Snap-hook....C. S. and A. S. Huntington
Snap-hook....A. Jobnson
Sodium sulfate and sulfuric acid. Recovering....A. W. Nibelius
Sole support. Shoe-....J. W. Arrowsmith
Sound-amplifying horn....J. F. Wheeler
Spectacle-clamp....S. A. Asquith
Speech, signals, &c. Receiving and strengthening the reproduction of....E. S. Hagemann
Speed recorder and indicator....F. Lyon
Spinning-machinery ring....C. T. Atherton
Spinning-mule....H. S. Golland
Spool-holder....H. D. Clark
Spraying apparatus....J. V. Pearse
Spring-motor....S. B. Bynum
Springs. Making coil-....N. S. Harter
Springs. Means for cutting coil-..N. S. Harter
Stamp-mill....F. I. Matthews
Steam-generators. Electrical control apparatus for....R. Lomax et al
Steam or vacuum gage....J. Ely
Steel. Manufacture of high-per-cent. manganese....C. H. Kelsall
Steel plate. Face-hardened....C. Davis
Steering-gear....T. J. Fay et al
Steering-wheel....E. F. Upton
Stool....E. P. Lang et al
Stop-action. Combination....J. O. Funkhouser
Store-bin....P. T. J. Estler
Stove attachment....A. H. Merrill
Stoves. Automatic cut-off for gas-..J. Zillhardt
Stovepipe-hanger....W. A. Wilson
Stovepipe-joint, 2 pats....H. S. Blood
Street-sweeping machine....C. Malmquist
Switch....M. B. McConnell
Switch-stand....W. W. Allen et al
Swivel. Hydraulic....H. G. Johnton et al
Swivel. Water-....K. Brooks
Syringe. Electrotherapeutic....H. R. Cool
T. Two-male....G. A. Miller
Tap-holder. Reversing....W. A. Leonard
Tapping apparatus. Main-..W. H. Van Winkle
Tea-kettle....W. C. Belcher
Telegraphone....V. Poulsen et al
Telegraphone....V. Poulsen
Telegraphone purposes. Electromagnet for....P. O. Pedersen et al
Telephone-lines. Lock-out switch for party..O. F. Forsberg
Telephone system. Party-line....N. S. Page
Telescope....A. Hahn
Telescope with support. Double....R. Straubel
Temperature-regulator....V. F. Davis
Theatrical device....T. G. Lafayette
Thermostat....C. A. Cypbers
Thill-coupling....R. F. Corneil
Thill-coupling....J. L. Taylor
Thread-finishing machine. Silk-....X. Bossart
Ticket apparatus....H. H. Cummings
Tile....P. J. McGuire
Tire for vehicle-wheels. Pneumatic and solid..J. Burnham
Tire for wheels. Elastic....T. L. Carbone
Tobacco-pipe....E. Engholm
Tongs. Adjustable roofing-....P. Emrich
Tool. Combination-....B. A. Mansfield
Tracker-bar....J. Hattemer
Train-controlling means....E. Renaud
Transformer....J. J. Frank
Transformer....L. C. Nichols
Transparency....P. E. Collins
Tripod and attaching device....C. I. Flory
Trolley and harp therefor....S. F. Estell et al
Trolley. Electric....A. S. Janin
Trolley-head....G. P. Copp
Trolley-wheel....E. N. Luburg
Trolley-wire ear....W. G. Carey
Trousers-expander....J. Sargh
Truck....F. M. Morton
Trunk-tray....L. Guynn
Tub-rack....S. K. Painter
Tug and trace fastener..A. V. Cunningham, Sr.
Turbine....A. Oliver
Turbine-buckets. Tool for cutting...J. Riddell
Turbine-driving means. Hydraulic-....C. Herschel
Turbine. Elastic-fluid....O. Junggren
Turbine-governing mechanism....O. Junggren
Turbine-wheel....E. Imle
Turbine-wheel....W. D. Boyce et al
Turbines. Condenser for elastic-fluid....A. T. Gray
Turpentine-hack....C. H. Driver
Type-writer....C. S. DuBelle
Type-writer ribbon-holder....M. B. Nixon
Type-writing machine....W. J. Barron et al
Type-writing machine....F. X. Wagner
Type-writing-machine computing attachment....O. C. Kayle
Type-writing-machine ribbon mechanism....J. W. Kennedy
Umbrella attachment....W. O. Shepard et al
Umbrella or parasol. Folding....A. C. Roller
Valve....J. H. Martindale
Valve. Automatic....A. Michaels
Valve. Fluid-pressure....H. Woods
Valve for explosive-engines. Admission-....H. C. Fricke et al
Valve for fluids under pressure....H. Woods
Valve for gas apparatus. Hydraulic reversing-....F. H. Wagner
Valve for hermetically-closable jars....G. Staunton
Valve for hydraulic transmission devices. Controlling-....W. C. Schwarz
Valve for hydrocarbon-engines. Throttle-....C. Schmidt
Valve. Trap-....J. L. Donat
Vaporizer....G. H. Bell
Vehicle-brake....M. Jewell
Vehicle. Motor-....W. C. Schwarz
Vehicle-spring....P. J. McGinn
Vehicle-spring....G. Schmitt
Vehicle-top....J. A. Memsley
Vehicle-top support....G. Lake
Ventilator....W. Hammann
Voting-machines. Counter-carrier for....C. C. Abbott
Voting-machines. Grouping mechanism for....C. C. Abbott
Wagon-brake....F. Rick
Wagon. Dumping-....A. L. Warner
Waistband....J. C. Stanford
Washboiler....L. A. Ritter
Watch. Pendent winding and setting....D. A. Lindgren
Water-heater....J. Stott
Water-heating device....A. C. Sargent
Water-tank heater....D. H. Quinn
Water-wheel. Current....A. A. Porter
Weaner. Calf-....E. E. Dehler
Weaving in natural colors without pattern-cards. Apparatus for....A. Regal
Weighing and measuring device..A. E. Abbott
Wheel....G. B. Hurlburt
Wheel....C. E. Brinley et al
Whiffletree-hook....L. J. Austin
Window. Casement-....J. H. Hiltz et al
Wire-crimping machine....J. L. Alley
Wire-fabric blank....W. C. Willets
Wire-stretcher....R. G. Larsen
Wood-splitting machine....P. Eckenroth, Jr.
Wrench....H. A. Pomette
Wrench....H. Jeffrey
Wrench....C. Auern

DESIGNS.

Automobile-body....F. S. Davis
Book-plate....A. E. Bachert
Calendar-blank....J. L. Knight
Cream-separator. Centrifugal...T. W. Morgan
Drill housing. Electric-....E. F. Smith
Fabric. Woven 2 designs..C. H. Landenberger
Furniture-handle....L. W. Bond
Knob. Door-....E. T. Schoonmaker
Lock-trimming....E. T. Schoonmaker
Neckwear fabric....L. Auerbach
Phonograph-horn, 2 designs....E. L. Aiken
Signet, 2 designs....C. E. Hansen

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Adding-machines. Digit-repeating mechanism for....C. N. McFarland
Adjustable bracket....M. Kurtzon
Air-brake system....F. H. Dukesmith
Alarm system. Electrical....W. N. Fawcett
Alloy. Metal, 2 pats....E. Haynes
Amusement apparatus....E. T. Sulzer et al
Amusement. Illusion apparatus for....F. Darcy et al
Animal-trap....R. C. Randall
Animal-trap....W. H. Howard
Animal-trap....R. Chassé
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Ash-pan. Self-regulating....C. W. and E. C. Hamel
Axle-cutter....D. W. McClay
Bag-holder....O. A. Pust
Bag or sack fastener or closure....A. T. Hamilton et al
Baking....A. P. Anderson
Baling-press....F. B. Cumpston
Baling-press head-block....G. W. Spaulding
Baling-presses. Bale-tying mechanism for....C. E. and H. W. Bower
Balloon-inflator....F. J. Creque
Ballot-strip-locking device....C. C. Abbott
Basket-making machines. Nailing mechanism for....E. Horton
Bath-cabinet....A. M. Walstrom
Bathing-suit....J. Bullis
Bearing. Roller-....J. E. Sackett
Bed-spring....W. R. Boisvert
Bell. Electric....J. F. McElroy
Belt end....C. Bloomberg
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Binder for loose leaves. Temporary....H. Wiedeman
Biscuits from their pans. Mechanism for detaching....G. Herbert, Jr.
Boiler stand. Range-....C. L. Holden
Bolster. Body-....H. A. Wahlert
Bolt-header....C. H. Hopkins
Bolt locking mechanism. Split-..W. W. Parsons
Bolt-machine....H. Crehan
Book-cover....I. S. Wolcott
Bookcase....T. J. Lamping
Boot and sboe....J. H. Cunningham
Boring and turning mill....J. Riddell
Boring device....J. W. Cone et al
Boring-machine....T. Leeland
Bottle-closure....R. Koch
Bottle-holder. Barber's....J. W. B. Faris
Bottle. Non-refillable....H. O. McClurg
Bottle. Non-refillable....I. I. Kremer
Bottle-stopper....G. Kirkegaard
Bottles. Guard for non-refillable....H. J. Mortensen
Box, 2 pats....A. Merckens
Box....S. W. Helm
Box-cover lifter....R. L. Tudor
Bracelet....I. R. Lederer
Brake mechanism....F. Sedziak
Brewing soy. Apparatus for....T. Suzuki
Bridges. Safety-curtain for preventing run-away accidents on....M. Goodman
Brooder....C. A. Cyphers
Brooder and grower. Plant and vegetable....W. P. Lutz
Broom....W. D. McAtlin
Broom and dust-pan hanger....N. L. Lyons
Brush. Sectional hair-....C. A. Fetters
Buckle....M. Rubin
Buckle....C. S. and A. S. Huntington
Buckle. Back-band....J. H. B. Butts
Buckle-bar....F. E. Farnham
Building-block-molding machine....A. Nelson
Buoy. Signal-....T. L. Willson
Burglar-alarm....G. A. Humason
Burglar-alarm. Portable....J. L. Mulry
Butter-cutter....J. M. Low
Butter-cutting machine....R. W. Stevens
Butter-separator....G. W. Winters
Button. Collar-....J. N. Mills
Button for lacing terminals. Fastener-....T. F. Burke
Button. Shoe-....E. S. Ellis
Cabinet....E. U. Kinsey
Cable-drum mechanism....C. Pirtle
Calipers. Micrometer-....E. Heym
Can closure....S. B. Sleight
Can-opener....B. Biehl
Cans and otber receptacles. Closure for....W. F. Hyatt
Candlestick and candle-holder....M. E. M. Reischer
Cand·· material or other commodities. Machine for sizing, cutting, and marking....A. H. Bartlett
Car draft-gearing. Railway....J. F. Courson
Car. Dump-....T. R. McKnight
Car or locomotive. Electrically-propelled....E. H. Anderson
Car-seat. Auxiliary....N. Joergensen
Car-stop. Automatic....G. H. Richards
Car. Tank-....F. L. Irwin
Car-underframe....C. S. Shallenberger
Car-unloading apparatus. Grain-....F. R. McQueen

Car-ventilating apparatus. Passenger-.....O. Hoffman et al
Car-ventilator.....T. H. Garland
Carpet and rug stretching device..H. Hardwick
Carriage-curtain fastener.....W. S. Jonah
Carriage. Folding baby-.....G. E. Dann
Cart. Hand-.....B. F. Brown
Cash-issuing machine.....R. A. Dallugge
Caskets. Fabric frame for.....A. Sauer, Jr.
Casting. Chilled.....C. J. Mesta
Cautery.....L. De Forest
Celluloid and similar substances. Apparatus for utilizing the waste of.....E. Garbin
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Chair-seat.....J. W. Henry
Chalk-line holder.....F. J. Stanley
Chimney cap or ventilator.....J. C. Rothbarth
Chopping and extracting apparatus.....O. Wehrle
Churn.....A. H. Gragg
Churn. Revolving-paddle.....E. Blackford
Chute for wagons. Discharge-.J. Harbolsheimer
Cigar-machine roll.....R. A. Bright et al
Circuit-breaker.....F. W. Blair
Circuit-breaker. Automatic.....G. W. Hart
Clamp and spreader. Combined.....J. R. and A. Zeiser
Clamp-setting machine.....B. A. Grasberger
Clasp.....M. M. Sturm et al
Clip.....A. W. Ullom
Closet-cisterns. Siphon-valve for.....N. B. Johnson
Clothes-pin clip.....M. O. Winkler
Clothes-pounder. Atmospheric....S. D. Griffith
Clutch.....O. Tornfelt
Clutch. Friction-.....E. Sprung
Coffee and tea urn.....C. A. Barwise
Coffee mixture.....A. E. Crocker
Concrete construction. Reinforced.....J. W. Muldoon
Concrete. Machine for molding units of clay or other refractory material to be used in the manufacture of.....W. D. Crow
Concrete wall. Reinforced interlocking.....R. Edmondson
Condenser.....N. S. Hopkins
Conduit-threading device.....A. H. De Voe
Controller.....E. W. Stull
Controller-regulator.....C. P. Ebersole
Controlling mechanism.....J. J. Nef
Conveyer.....S. F. Joor
Conveying apparatus.....T. S. Miller
Cookers and exhausters. Conveying means for can.....M. W. Groom
Copy-holder.....N. J. Schlingloff
Cord or twine holder.....H. M. Danker
Corn-ear rack.....M. N. Flugum
Cotton-chopper.....N. S. Sodekson
Counter. Registering-.....P. L. Johnson
Crank mechanism. Swinging-lever.....X. Baier
Cultivator. Orchard-.....J. Lingaas
Current motor. Alternating-.....E. F. W. Alexanderson
Current-supplying arrangement.....B. Salomon
Curtain-bracket. Adjustable.....J. Doran
Curtain-fixture.....C. L. Hopkins
Curtain. Flexible.....H. E. Vance
Curtain-pole.....A. Freedman
Curtain-pole.....A. J. Boyers
Cycloramic apparatus.....R. G. Gordon
Dental articulator.....W. Hare
Dental plugger.....R. H. Antes
Dental soldering apparatus.....J. W. Horner
Desk attachment.....J. S. McComb
Detector-bar.....C. Herringer
Dispensing apparatus.....G. J. Holl
Display apparatus.....J., Jr., and A. A. Wiedemeier
Display-case for post-cards, &c.....A. C. Cedarburg
Display device for cigar-boxes...W. P. Bowers
Display-rack.....F. D. Eno et al
Display-stand.....W. D. Molony
Distilled spirits. Package for.....E. Bradley
Ditching and grading machine.....O. E. Casey
Door-hanger.....M. E. Kanaly
Doors or the like. Brace for screen.H. C. Axx
Double objective.....M. von Rohr
Draft-equalizer.....F. M. Smiley
Drawer. Card-index.....B. P. Kenyon
Drenching-bit.....G. W. Ratliff
Drier.....F. G. Sargent
Drying device.....O. Busse
Drying-machine.....S. A. Cohen
Duplicating apparatus.....F. Ries
Dye and making same. Red azo.....R. Schüle
Edge setting or hurnishing machine.....A. Harrington
Educational appliance.....A. J. Barber
Egg-case. Folding or collapsible.....M. Miller
Electric conduits. End cap for...H. P. Moore
Electric controllers. Automatic cut-out for.....A. C. Eastwood
Electric fixtures. Canopy for.....J. H. Dale
Electric furnace.....G. Holmgren
Electric lighting.....E. A. Sperry
Electric machine. Dynamo-.....J. L. Burnham
Electric machines. Dynamo-.....K. A. Pauly
Electric switches. Turn-button for.....H. E. Leppert
Electric transmission of intelligence...I. Kitsee
Electrical accumulator.....C. Busch
Electrolytic cell.....A. E. Gibbs
Elevator.....P. Hinkel
Elevator-lock.....M. Dashiell
Engine circuit-closer. Explosive-..T. A. Bemus
Engine-starting mechanism.....J. T. Barber
Engines. Piston for internal combustion or explosion.....J. Hartoch
Engines. Reverse-gear for four-cycle combustion-.....F. T. Flinchbaugh
Envelop.....H. L. White et al
Excavator-scraper.....L. A. Désy
Excavators. Dipper and dipper-handle for.....J. P. Karr et al
Explosive-engine.....L. E. Thompson
Explosive-engine.....H. Grade
Eyeglass-case.....O. Ducker
Eyeglass-hook.....J. O. Adams
Fabric-roll protector.....P. Buckborough
Falling bodies. Apparatus for determining the law of.....J. C. Packard
Fan.....S. Webb et al
Fan. Centrifugal.....L. B. Cousans
Fan. Pneumatic.....C. Kuderer
Feeder. Boiler-.....W. J. Jeffries
Fence.....E. Barth
Fence-post.....C. Lemere
Fertilizer-distributer.....W. Zachow
Fertilizer-distributer.....J. J. Jones
Fire-alarm and signaling device....L. Sackwitz
Fireproof lining.....F. O. Werther
Fishing-reel.....H. C. Reichardt
Fluid charging and discharging device. Compressed-.....G. A. Bobrick
Fluid-pressure brake.....W. V. Turner
Food. Cotton-seed.....J. von der Kammer
Form. Garment-..W. F. and E. T. Palmenberg
Forms. Apparatus for constructing dress-.....L. Lemcke
Furniture.....O. Vikören
Furniture. Metal folding.....H. Grauel
Fuse attachment-plug. Cartridge-.....R. A. Cultra
Fuse indicator. Safety-.....C. N. Sachs
Garment-pads. Making.....G. Goldman
Garment-supporter.....F. E. Coulter
Gas-burner.....A. Meyer
Gas-burner.....R. Gefäll
Gas-engine. Vertical.....W. von Oechelhaeuser et al
Gas generator. Water-.....F. Dannert
Gas-lighter. Electric.....J. Dickens
Gas-producer.....S. Griffin
Gas-producer.....O. K. Zwingenberger
Gas-producer connections. Cleaning.....R. H. Miller
Gas-producers, furnaces, &c. Feeding mechanism for.....J. A. Waldburger
Gas-regulator.....G. L. Lewis et al
Gases of motors. Apparatus for deodorizing the exhaust-.....A. Reichel
Gate and operating means therefor.....H. L. Coats
Gear. Roller-tooth.....C. A. Janson
Gear. Variable-speed transmission and reversing.....W. S. Hovey
Generator and burner. Combined.....R. M. Jackson
Gong. Pneumatically-operated.....F. B. Corey
Governor.....I. J. Babcock
Grader.....E. F. Higgins
Grain-cleaner.....A. C. Brantingham
Grain-drill.....T. Umrath
Grain-elevator.....J. W. Roberts
Grain, ore, and mineral separators. Cut-off and blast-regulator for.....W. Gray
Grain-separator.....F. F. Wells
Grain-storage elevator.....F. R. McQueen
Grinding-mill.....H. C. Robinson
Gun-case.....H. C. Reutar
Gunpowder. Manufacture of....C. W. Volney
Hair-cut register.....J. W. B. Faris
Hair-drying apparatus.....R. Grape
Hammer. Pneumatic.....M. Hardsocg
Harrow attachment.....H. C. Green
Harrow-disk.....L. E. Waterman
Harrow-transporter.....I. A. Weaver
Harvesting and husking machine. Corn.....J. Ross
Hat-curling iron. Electric.....J. L. O'Brien
Headwear.....A. O. Gordon
Heater protector. Oil-.....E. H. Brown
Heating apparatus. Vacuum.....C. C. Peck
Heating system. Vacuum.....C. C. Peck
Hedge-trimmer.....J. A. Bechtold
Hinge.....S. S. Arnold
Hoisting apparatus.....E. Putnam
Hoisting mechanism.....B. F. Shafer
Hoisting-tower.....W. J. Haskins
Horse-detacher.....W. H. Eckman
Horse-detacher.....M. R. Ritts
Horseshoe.....C. N. Stevens
Horseshoe-machine.....A. Smith
Hose-coupling.....G. E. Peterson
Hose-couplings. Electrical connection for.....F. Hoffman
Hose-supporter.....M. Sternberg
Hot-water supply.....D. S. Cole
Houses. Running-gear for portable.....W. F. Kramer et al
Housing.....H. Krantz
Humidifying and air-moistening apparatus.....S. W. Cramer
Hydrogen from water-gas. Producing.....A. Frank
Inertia-governor.....H. Lentz et al
Ink-well.....A. J. Bluntach
Innersole.....H. Cohen
Innersole.....B. Nathan
Insulated coil.....C. F. Peterson
Insulated rail-point.....B. Wolhaupter
Insulating covering or sheathing for contract-rail conductors.....W. H. Baker
Insulating end post for rail-joint circuits.....W. E. Karns
Internal-combustion engine.....E. H. Clift
Internal-combustion engine.....F. Lyst
Internal-combustion engine.....B. A. Slocum
Internal-combustion engine.....O. H. Shroyer
Ironing-board.....F. C. Geiger
Jars, bottles, and like receptacles. Closure for.....M. D. Converse
Kettle-lid.....M. J. Trett
Knitting-machine pattern mechanism.....H. A. Houseman
Knobbling-furnace.....W. Sharp
Label-paster.....G. N. Byl et al
Labeling machine. Can-.....J. H. Kain
Lamp-burner.....J. E. Ross
Lamp-socket.....J. J. Rooney
Lathes. Adjustable feed-carriage for.....C. A. Fischer
Latrinc for use in the field.....F. C. Herrick
Laundry-marking machine.....C. H. Maiben
Lavatory.....E. G. Watrous
Leather, &c., into continuous strips. Machine for cutting.....F. W. Merrick
Leather-working machine.....J. Rood et al
Lever mechanism.....F. A. Falk
Life-preserver.....A. Necker
Lifting-jack.....G. F. Freed
Lifting-machine.....E. and U. S. De Moulin
Line-space-indicating deviee.....C. C. Poole
Liquid-applying deviee.....P. R. Glass
Liquid ripener, pasteurizer, and cooler.....A. Jensen
Lithographic rollers. Means for mounting stone.....H. Wagner
Loom power-gage and lug-strap...C. A. Messer
Loom-reed.....A. Marcante
Loom-shuttle.....A. Guldemann
Lubricator.....J. T. Pedersen
Macaroni and other substances. Apparatus for drying.....L. von Süsskind
Magnetic brake.....F. G. Haldy
Mail-bag deliverer.....J. Millsap
Mail-bag receptacle.....G. C. Whiteford
Mail catcher and crane.....O. M. Peregrine
Mail-chute.....J. W. Cutler
Mail-pouch catcher.....J. W. Pepple
Mail-pouch crane.....H. W. Kline
Mail-pouch deposit and collection apparatus.....M. C. Dillen
Manure. Treating.....F. A. Goeekeler
Massage, shampooing, and other purposes. Implement for.....H. F. Schelling
Massage treatments. Register-operating device for.....J. W. B. Faris
Match-safe. Calendar.....F. P. Andrus
Match scratch and receptacle.....D. Lange
Matrices. Producing, 2 pats.....W. H. Welsh
Mattress and bedclothes holder.....G. E. Parker et al
Measure. Tape-.....F. Buck
Measuring device. Skirt-.....M. J. Bovard
Measuring the angles of sight. Apparatus for..E. Schneider
Mechanical movement.....N. B. Wales
Metallic compounds. Purification of.....C. Van Brunt
Metallic tie and rail-fastener.....E. L. Geer
Metals. Apparatus for electrodepositing.....W. Müller et al
Metals. Producing homogeneous bodies from tantalum or other highly-refractory.....M. von Pirani
Milking-machine.....C. C. Parsons
Mining machine. Coal-.....T. J. Newcome
Molding apparatus.....C. H. Latham
Mortar-making machine.....P. Schwiete
Motion and controlling the transmission thereof. Clutching device for communicating rotary.....F. Bailey et al
Motor.....H. A. Hatfield
Motor.....G. P. B. Hoyt
Motor.....E. O. and L. H. Cochran
Motor-control system.....A. McIver
Motor-starter.....A. W. Manz
Motor switching device. Electric-.....J. B. Wiard
Muffle or annealing furnace.....A. Smallwood
Music-leaf turner.....C. A. Matheny
Music-roll.....H. Koch
Musical apparatus. Tracker-board for legato and other effects in pneumatic.....H. Binney
Nose-ring.....J. C. Jacoby
Nose-ring.....A. A. Landon
Nut-lock.....E. C. Beverage
Oar. Bow-facing.....H. Flint
Ocular. Ramsden, 2 pats.....A. König
Oil-can.....W. Irving
Oil-column.....W. M. Rose
Oil-testing apparatus.....W. C. Robinson
Optical testing apparatus.....J. F. Forth et al
Ore-concentrator.....U. S. James
Ore-feeding mechanism.....M. Henson
Ores. Treating.....F. M. Johnson
Overshoe-holder.....G. W. Dopkins
Packing-case.....J. H. S. Johnson
Pail holder. Milk-.....A. J. Hurd
Paper-bag holder.....F. D. White
Paper-stock-refining machine.....A. Jones et al
Paper-weight, knife-rest, and optical device. Combined.....J. L. Borsch
Pen. Drawing-.....G. H. Chavey
Pen. Fountain-.....J. P. Morris
Pencil.....D. C. Huntley, Jr.
Pencil-holder.....S. M. Lewis
Pharmaceutical coating.....E. Donard et al
Phonograph.....H. F. Holmes
Phonograph.....C., Jr., and W. Thoma
Photographs on metal, glass, porcelain, &c. Producing.....A. Hans
Photography. Combination of line and screen.....E. Mertens
Piano-pedal.....L. Haas
Piano sounding-board.....W. H. Knight
Pianoforte.....G. Caddick
Pile fabric.....H. Hardwick
Pin.....C. F. Markham
Pipe coupling. Train- 2 pats..G. E. Kelly et al
Piston and piston-packing, 2 pats.....M. H. Sullivan
Planers. Knife-jointer for the bottom cutter-heads of wood-.....C. W. H. Blood et al
Planing-machine feed mechanism...H. B. Ross
Planter. Corn-.....W. M. Bering et al
Planter. Corn-.....E. R. Ellefson et al
Planter. Potato-.....E. G. Schreiber
Planter. Seed-.....T. L. Beaman
Plastic composition. Producing.....H. Schudt
Plumber's trap.....A. J. Rudolph
Pneumatic-despatch-tube apparatus.....E. A. Fordyce
Pole-changer.....L. Kiblinger
Potatoes, onions, and other products. Machine for grading and cleaning.....J. Gascard et al
Poultry-picking device.....E. Covert
Power. Apparatus for converting, storing, and utilizing wind-.....B. Valiquet
Power-dam. Portable.....W. H. Crow
Power-transmission apparatus. Liquid-.....L. J. Wing
Power-transmitting device.....G. E. Blake
Power-transmitting mechanism... F. Bucherer
Power-transmitting mechanism.....H. B. Smith
Pressure-regulator. Automatic....C. P. Tolman
Printing-machine.....W. Spalckhaver
Printing-machine.....J. H. Pillings
Printing-machine or time-stamp...J. C. Wilson
Printing machine. Stencil-.....A. B. Dick
Printing-plate clamp.....S. E. Dittman
Printing-press. Rotary.....H. M. Barber
Projectile.....T. S. Aveson
Propelling apparatus.....G. Unzner
Pulley-casing. Sheet-metal.....F. E. Sloan
Pulleys. Means for stretching covering around.....A. B. Gerbrand
Pump-mounting.....S. Pennell
Punch. Power-.....C. Gordon et al
Punching device. Structural-iron-.....C. H. Henderson
Rail-bond for rail-joint circuits....W. E. Karns
Rail clamp. Guard-.....N. O. Goldsmith
Rail-joint.....J. Sevcik
Railway-rail and joint therefor.....A. H. Hoover et al
Railway-spike.....H. J. Dykes
Railway-switch.....J. S. Jones
Railway-switch structure....H. R. Luther et al
Railway-tie.....H. G. Willits
Railway-tie.....J. C. Heintz
Railway-track structure.....F. F. Stockwell, Jr., et al
Range. Kitchen-.....C. H. Miller, Jr.
Raisins. Apparatus for preparing and paeking seeded.....N. B. Converse
Range-top.....A. W. Brand
Ratchet-wreneh.....J. J. Albreeht
Receptaele.....C. J. Schmidt
Recorder and reproducer.....T. H. Macdonald
Refrigerator.....H. C. Nott et al
Register.....L. D. Smith
Registering deviee.....M. M. Shumaker
Rein-holder.....C. M. Crum
Relay. Throttle-.....A. S. Cubitt
Reproducing and imitating machine.....B. O. Fanslow
Resistance. Non-inductive.....J. F. McElroy
Reversing mechanism.....S. T. Nelson
Road-roller.....E. T. Wright et al
Rock-drill and other percussion-tool.....T. Warsop
Rock-drill swivel.....S. A. Sizemore
Rocks, &c. Apparatus for breaking.....F. Lobnitz
Rolling-mill.....E. Ebinghaus et al
Roofing. Metallie sheet-..J. T. and O. G. Burris
Rotary engine.....U. and E. Duchesne
Rotary explosive-engine.....G. J. Weber
Rubber overshoe.....F. C. Hood
Sad-iron stand.....H. S. Pease
Safe or receptacle. Wall.....H. C. Lowrie
Safety-pin. Locking.....K. G. Dieterich
Sash-bar.....G. C. Hester
Sash-holder.....F. C. Jaeobs
Sash-holder.....A. H. Marden
Sash-lock.....F. Salter
Sash-lock.....G. M. Logan
Sausage linking and twisting machine.....H. W. Louden, Sr.
Scaffold-jack.....E. D. Hune et al
Scale. Rolling-mill.....M. Maurer
Scoop.....A. C. Gough
Scoop and scale. Combination.....T. T. Ellis
Scoop. Lard-.....H. L. Adams et al
Screw-driver.....J. McCoy
Screw-driving machine.....F. W. Sanford
Sealing bottles, jars, and other receptacles. Machine for.....J. V. Hull
Self-heating iron.....D. A. Jerald
Separator for lump material.....A. Langerfeld
Sewer-pipe.....C. Eschenbrenner
Sewing-machine.....A. Pfeufer
Sewing-machine attachment.....R. P. Mees
Shade and curtain-pole support. Combined window-.....G. W. Bush
Shaft and cross-bar brace. Combined.....F. M. Belden
Shaft-hanger.....H. F. Gade
Shaft-hanger, 2 pats.....H. T. Hallowell et al
Shaft-hanger.....H. F. Gade
Shaking-screen.....N. W. L. Brown
Sharpening, removing, and replacing cutter-sections. Apparatus for.....W. Rawlinson
Shave-register-operating device..J. W. B. Faris
Sheet-feeding apparatus.....A. B. Dick
Sheet-metal receptacles. Forming.....L. C. Krummel
Sheet-metal vessels. Machine for making.....E. J. Wittebolle
Ships. Device for diminishing the rolling motion of.....R. Skutsch
Shock-absorbing mechanism.....E. J. Young
Sieve. Adjustable.....C. Closz
Sieve-cleaner.....J. Olsen
Sieve. Separator-.....W. C. Black
Sifter. Household-.....W. J. McLoney et al
Sign.....G. Bittle
Sign. Illuminated.....J. Chester
Signaling apparatus.....W. L. McWhorter
Signaling apparatus. Block-.....J. D. Taylor
Signaling device. Automatic.....L. Caputo
Signaling device. Electrical.....J. P. Williams
Siphon.....W. S. Shields
Skate. Roller-.....C. M. Palmer
Skate wheel. Roller-.....T. S. Leitch
Skirt gage. Dress-.....J. La More
Sled-brake.....J. Wiekberg
Slitting and winding machine....H. P. Hilbert
Smelting-furnace. Electric.....W. R. Parks
Smelting ores.....J. C. Hardie
Smoking-pipe.....H. M. Hallett
Soil-working machine.....L. F. Bassett
Sole for boots and shoes. Metallic.....J. A. Donahue
Sound-reproducing machine.....L. T. Haile
Spark-plug. Electrie.....F. B. Thatcher
Sparking coil with multiple winding for ignition and like purposes.....A. Michel
Splice-bar.....E. E. Anderson
Spooling-machine reciproeating mechanism.....J. C. Callan
Stacker. Pneumatic.....B. G. Baker
Stamp-affixing device.....E. Wilson
Stamping and numbering machine....J. French
Stapling-machine.....H. A. Olsson
Stay-roller.....G. Wideman
Steam-shovel.....G. W. King, et al
Steamer. Egg-.....J. L. Adams
Steering vessels.....H. W. Wilke
Stethoscopes and other aural instruments. Ear-tip for.....C. H. Liverpool
Stone and making same. Artificial.H. O. Duerr
Stove. Lamp heating-.....W. W. Portmann
Stretcher-supporting frame.....H. Brusis
Sulfur. Apparatus for producing sublimed.....A. Walter
Suspenders.....G. W. Spotswood
Swath-divider attachment. Perpendicular.....J. H. Giles
Sweeping. Composition to be used in.....C. M. Vernon et al
Switch-operating mechanism....E. E. Frederick
Switch-stand.....A. D. Cloud
Swivel. Hydraulic..H. G. Johnston. (Reissue.)
Syringe.....B. F. Crisenberry
Table or easel.....T. J. Cantwell
Talking-machine horn.....A. G. Soisimann
Telegraphy. Transmitting device for electrie..I. Kitsee
Telephone-transmitter.....H. W. Haff
Telephone-transmitter.....C. J. Printz
Telephotographie objective....P. Rudolph et al
Tenoning-machine.....W. H. Hobby
Thermostats. Expansible cell for.....J. E. McElroy
Thill-coupling.....D. W. Copeland
Thread and also the twisted thread. Maehine for coating the strands of a.....E. D. C. Bayne et al
Thread-finishing machine. Silk-.....E. Pohl
Thread-guide.....N. Johnson
Tie-plate.....E. H. Bell

Tile gutter....J. Freund
Tin compounds and other products. Detinning and producing....E. A. Sperry
Tire. Vehicle-....J. Eckhard
Tire. Vehicle-....G. A. Pearse, Jr.
Tires. Protecting shield or guard for pneumatic....W. S. Arnold
Tires to vehicle-wheels. Means for attaching....E. Gerbert
Tool-holder....W. B. Mehl
Tool-holder....G. Nelson
Tooth crown and bridgework. Artificial....J. B. Righter
Toothpicks. Making....G. P. Stanley et al
Towel-wringer....C. M. Reed
Toy-railway-train stop and signal....C. A. Hotchkiss
Toy-railway turn-table....E. F. Slattery
Toy. Trundling....H. Stubert
Track-gage....E. W. Fordyce
Track. Portable sectional....B. C. Buxton
Traction-engine....B. Holt
Traction-varying device....B. Beskow
Train-lighting system. Battery....F. A. Decker
Tramway....F. Wolff
Transformer....J. Coates
Transmission and speed-changing mechanism....E. Schmidt
Trap....C. E. Self
Trap....W. H. Harden
Treating materials....C. W. Volney
Trolley....C. M. Rhodes
Trolley....G. Keresztes
Trolley....E. Y. Moore
Trolley-head....C. C. McClintock
Trolley-hoist....E. Y. Moore
Truck guard. Railway-....W. Sanford
Truck. Motor-....A. F. Batchelder
Trumpet support. Reproducing....W. C. Runge
Tube and flue cleaner....H. S. Stormer
Tube apparatus. Manufacturing....O. Zimmermann
Tuning device for timpani....H. A. Bower
Turbine....W. S. Elliott et al
Turbine. Marine....E. C. Carnt et al
Turret-machine. Multiple-spindle automatic....G. G. Prentice
Type casting and setting machine..O. Uhlworm
Type-cleaner....E. A. Johnson
Type-writer, 2 pats....H. L. Fisher
Type-writer shift-key mechanism..M. S. Cumner
Type-writer tabulator....J. H. Whitaker et al
Type-writing machine....C. E. Smith
Type-writing machine, 2 pats....E. B. Hess
Type-writing-machine adding attachment....H. L. Fisher
Type-writing-machine tabulator, 2 pats....H. L. Fisher
Unloading mechanism, 2 pats....W. R. Cunningham
Valise, dressing-case, and the like....H. Goldin
Valve attachment. Engine-....G. B. McKinney
Valve. Carbid-feed....F. E. Stover
Valve. Combined vent and check....D. F. Morgan
Valve. Flush-....C. I. Matson
Valve for fluid-compressors. Discharge-....W. Prellwitz
Valve for hydrants. Waste-...H. F. Neumeyer
Valve mechanism for fluid-pressure brakes. Graduated-release....W. V. Turner
Valve-operating apparatus....J. C. Larkam
Valve-operating means. Exhaust....C. O. Hedstrom
Valve. Whistle-....F. L. Wolfe
Valves or cocks. Means for operating....W. J. McCarroll
Vehicle....E. C. Bruen
Vehicle attachment. Self-propelled-...O. Smith
Vehicle-brace....P. Jess
Vehicle brake. Power-driven-...J. N. Mahoney
Vehicle screen. Motor-....T. H. Whiting
Vehicle-wheel....C. E. Cole
Vehicle-wheel....W. E. Snediker
Vehicle-wheel....H. M. Starley
Vehicles. Longitudinally-displaceable car-body for motor-....R. Diesel
Velocipede....O. A. Morse
Vending-machine....C. B. Ford et al
Vending-machine....H. S. Pond
Vending-machine cabinet....H. S. Pond
Vending machine. Cigar-....H. J. Davidson
Vessel-hull....I. E. Palmer
Vise. Pipe-....H. R. Sinclair
Vise. Pipe-....H. R. Sinclair et al
Voting-machine frame....C. C. Abbott
Voting-machines. Independent-shutter-locking mechanism for....C. C. Abbott
Voting-machines. Mechanism for attaching counters in....C. C. Abbott
Voting mechanism. Question-....C. C. Abbott
Wagon-dump....J. F. White
Wagon-rack fastener....J. I. Morgan
Wardrobes. Article-support for....L. Rémond
Washing-machine....W. T. Bottenfield
Washing-machine....H. Iserman
Washing-machine....B. A. Stocking et al
Washing-machine gearing....L. W. Mammen
Water-heater....H. K. Ernsberger
Water-supply system. Automatic..H. C. Sillett
Watering-trough. Automatic....T. Olson
Waterproof fabric....E. Mérou
Weaving in natural colors without pattern-cards....A. Regal
Weighing machine. Coin-controlled....A. A. Caille et al
Welding machine. Copper-....G. Rosenberry
Welding metals....F. Jottrand et al
Well packing. Oil-....W. B. Daugherty
Well-pipe lifter....J. A. Kimbro
Wheel....L. Long
Winch. Hydraulic....J. G. Winger
Window fastener. Storm-....W. Bourque
Window-operating mechanism. Ventilating-....S. E. Cibulas
Window-tent....W. E. Walsh
Wire multiple system. Three-....C. S. Winston
Wire-stretching tool....J. L. Scott
Wood-trimming machine....C. E. Brown et al
Wrench....J. W. Kline
Wrench....F. Hachmann
Wrench....E. R. Klemm
Wrench....G. W. Jessop
Wrench....W. Webb et al
Wringer-tray and drip-board. Combined....W. H. Voss....

DESIGNS.

Brush. Shoe-polishing....J. A. Kreag
Card. Playing-....S. R. Beal
Dish....W. C. Anderson
Gage casing. Temperature and pressure....H. W. Maurer
Gas-burner....T. J. Litte, Jr.
Gas-burner....T. Stites
Nut-crackers, nut-picks, and similar dessert-cutlery. Handle for....M. N. Jarvis
Skirt....D. Crystal et al

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MECHANICAL PATENTS.

Acid. Methylene citryl oxytoluic....R. Berendes et al
Adjustable chair....J. Prescott
Advertising-machine....H. A. Ironside
Air-heater....F. W Green
Air motor. Compressed-....T. L. Jones
Animal-shears....T. A. Martin
Announcing or advertising apparatus....E. Charles
Armor-plate. Finishing....E. W. Lewis et al
Attaching device....A. Hampe
Automobile....H. L. Ide
Automobile sleigh....W. C. Weiss
Automobiles. Transmission-gear for....C. W. Smart
Axle. Lubricating-....W. E. Dalby
Bag-closing machine....T. J. Brough
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(*Continued in March Number.*)

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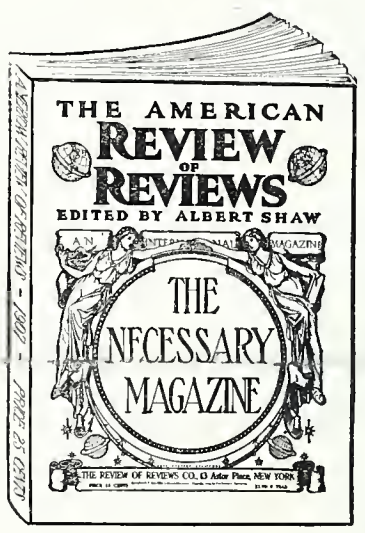
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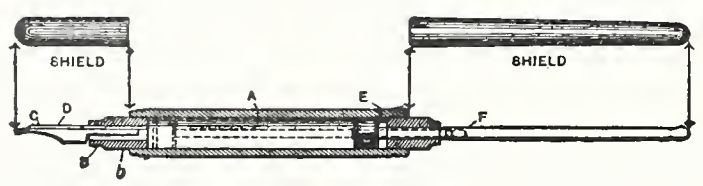
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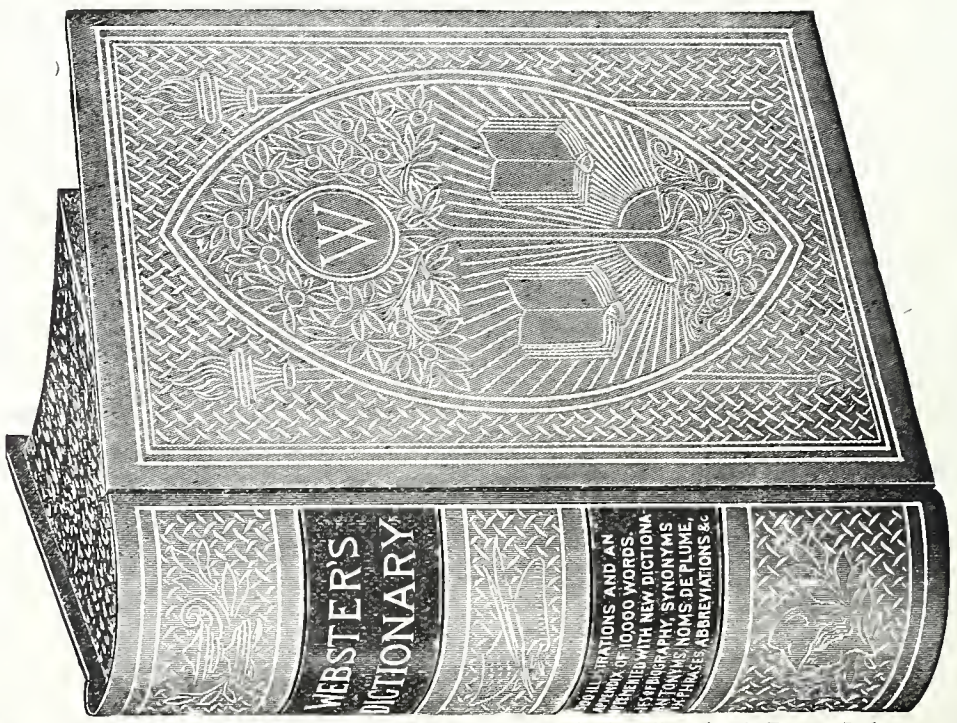


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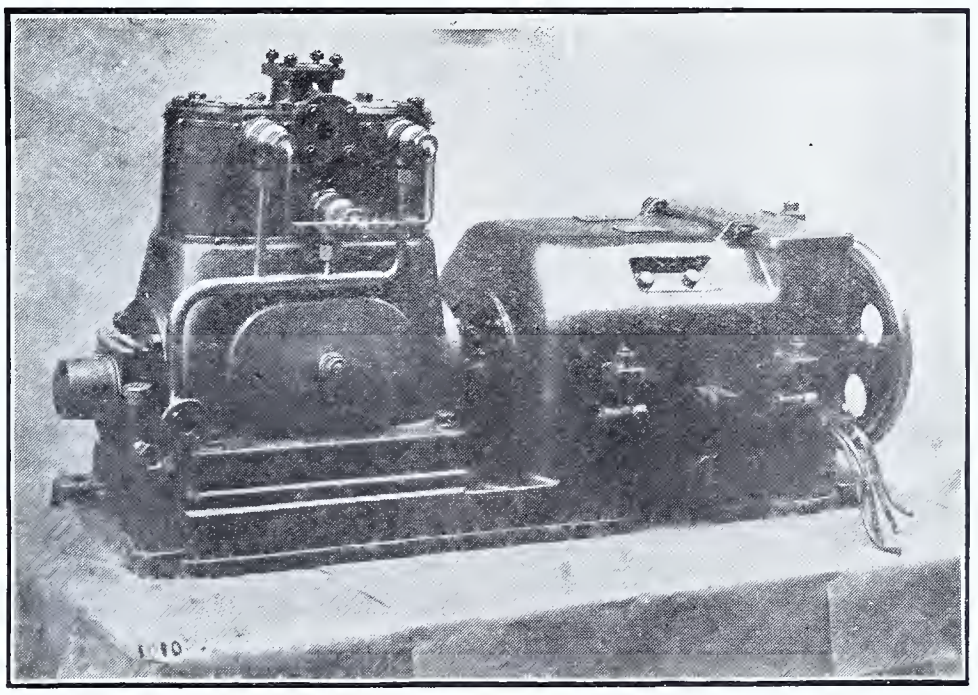
UP-TO-DATE AMERICAN ELECTRIC TRAIN LIGHTING.

By FRANK C. PERKINS.

AMERICAN railways, as a class, have been slow in introducing electric lighting on the trains of the trunk lines; but at the present time there are many roads which find this system the most practical, and far superior to gas lighting.

In some instances storage batteries are installed on the various cars, with a system of electric charging by dynamos driven from the car axle, with various means of regulating the speed and reversing the current that is supplied to the accumulators when the engine reverses the direction of the movement of the train.

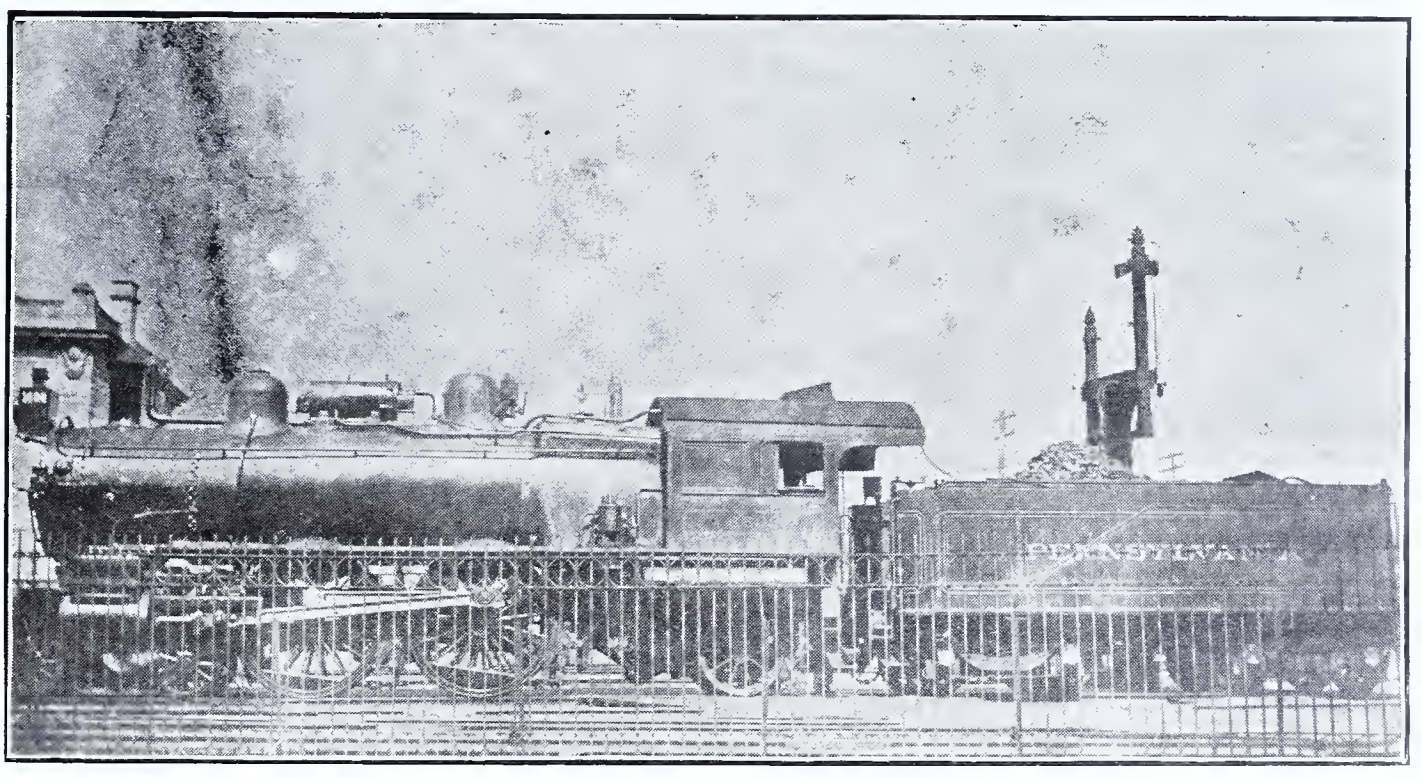
One of the most successful systems of electric train lighting at the present time is that using the steam turbine directly coupled to an electrical generator, either placed in the baggage car or installed on the top of the locomotive. The accompanying illustrations show the installation of Curtis Steam Turbine train lighting sets installed on the up-to-date American railways, as constructed and developed by the General Electric Company of Schenectady.



BELGIAN STEAM ENGINE GENERATOR INSTALLED ON LOCOMOTIVE.

With this American electric train lighting system, a non-condensing single stage steam turbine is directly connected to a 15 kw. or 20 kw. compound wound direct current electrical generator, and supplies the necessary current for lighting the train.

The arrangement of the apparatus is similar to that of the Hudson River Day Line boat installation on the "Hendrick Hudson." On the baggage car of the C. B. & Q. Railway trains there is installed a turbo-generator set operating at a speed of 3600 revolutions per minute, and supplying a current of 110 volts pressure, this being a bi-polar machine of from 20 to 25 kilowatts capacity.



CURTIS STEAM TURBINE INSTALLED ON PENNSYLVANIA RAILROAD CO'S. LOCOMOTIVE.

The Pennsylvania Railroad Company has also taken up the lighting of its trains by electricity very largely, and has experimented extensively with electric train lighting systems. This railway company has installed a 15 kilowatt Curtis Steam Turbine train lighting set in the baggage car "Kokomo" and the baggage car "Utopia" as shown in the accompanying illustration, this set being mounted in the corner of the car, taking up very little room, and giving, it is stated, excellent satisfaction.

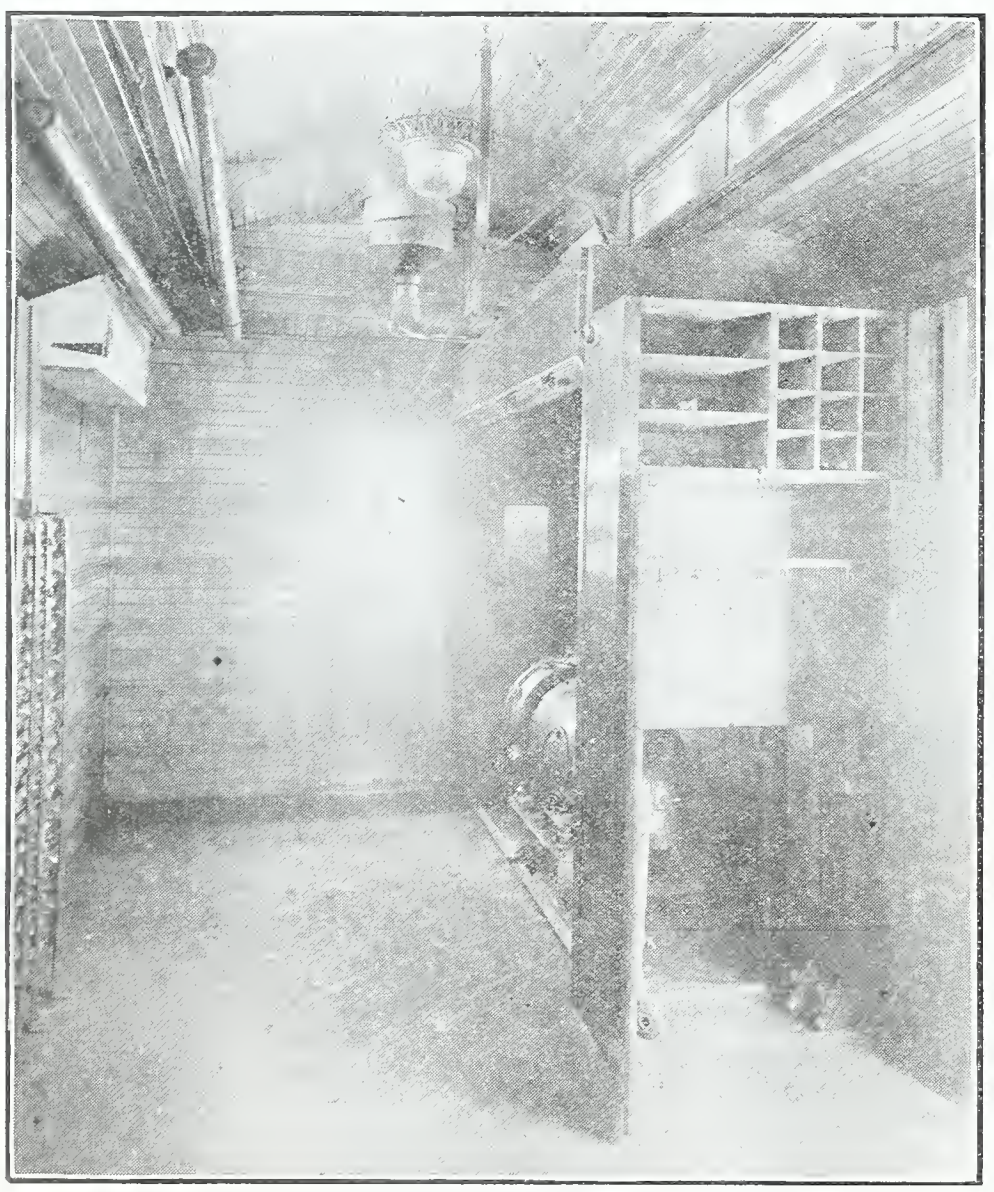
Another illustration shows a 15 kilowatt Curtis turbine operating at a speed of 3,000 revolutions per minute and delivering a continuous current of 115 volts, the generator being mounted on the shaft with the turbine. The Pennsylvania Railway Company has also installed 15 Curtis steam turbines and electrical generators on the top of the locomotives of their fast trains, the turbine and dynamo both being enclosed in a metallic case protecting the electrical equipment from the weather.

The 30 kilowatt bi-polar compound wound generator utilized for electric train lighting with the Curtis non-condensing single stage steam turbine is very compact, occupying a space less than two feet in width, a trifle over two feet in height, and 64 inches in length. The speed of this outfit is 4,500 revolutions per minute, and it weighs 150 pounds less than a ton. This single unit engine generator, when mounted on the locomotive, requires no steam couplings of the high pressure type, as full boiler pressure is available for the steam turbines directly from the boiler of the locomotive.

It is claimed however, that when the generating set is installed in the baggage car, it can be given closer attention and is more accessible. A storage

battery installation having 56 cells and giving 112 volts pressure is provided, capable of lighting the entire train for one hour without difficulty. It is in some instances distributed through the car, or is arranged in a single installation, according as to whether the train runs between the terminal stations solid or whether certain cars are removed. The accumulator cells are placed in the baggage car in the latter case, and are connected to the turbo-generator set.

It is maintained that the steam turbine single unit engine generator set is of high efficiency considering its output, the dynamo supplying a constant electrical pressure as the turbine operates at practically uniform speed. This system is simple in construction and installation, with far better regulation than the electric crane lighting system using axle driven dynamos charging storage batteries, and practically equal in control and regulation to the exclusive storage battery system.



CURTIS STEAM TURBINE TRAIN LIGHTING SET INSTALLED FOR THE PENNSYLVANIA RAILROAD CO. IN BAGGAGE CAR "UTOPIA."

It is generally conceded that electricity is far superior to oil and gas for train lighting, as there is little or no danger from fire, and the consumption of oxygen in the air and the disagreeable odors of gas and oil are entirely avoided.

A similar system of electric train lighting using a direct connected set is in use in Belgium by the Societe Anonyme Franco-Belge (Ateliers de la Croyere). This system includes a small two cylinder vertical engine directly coupled to a four pole direct current dynamo of the enclosed type mounted on the top of the locomotive. An automatic regulator is mounted on the top of the car in an enclosed metallic case, connected with the engine by a flexible cable and with the train lighting system by an iron conduit equipment mounted on the top of the cars. This Belgian train lighting installation is said to have given good satisfaction both as to economy and regulation.

Among the important European train lighting systems utilizing electric current for incandescent lamps should be mentioned the multiple unit axle lighting system of J. Stone & Company, Ltd., Debtford, London, England, in which storage batteries are utilized in connection with an electric dynamo suspended in such a manner that its pulley is nearly level with a pulley on the car axle, belt transmission being utilized for supplying the necessary power to the electrical generator.

Another multiple unit axle lighting system is that operating on the New York Central & Hudson River Railroad on the Empire State Express. This Muscowitts system has a dynamo spring supported from the car truck, and is also driven from the axle by a belt. This system is installed by the United States Light & Heating Company of New York.

The MacIlroy automatic lighting system of the Consolidated Car Heating Company of New York also utilizes multiple unit lighting equipment, the dynamos having rawhide pinions mounted on the ends of the armature shaft and geared to the car axle with an enclosing case, and an automatic governor for regulating the dynamo current, the charging battery and the electric pressure.

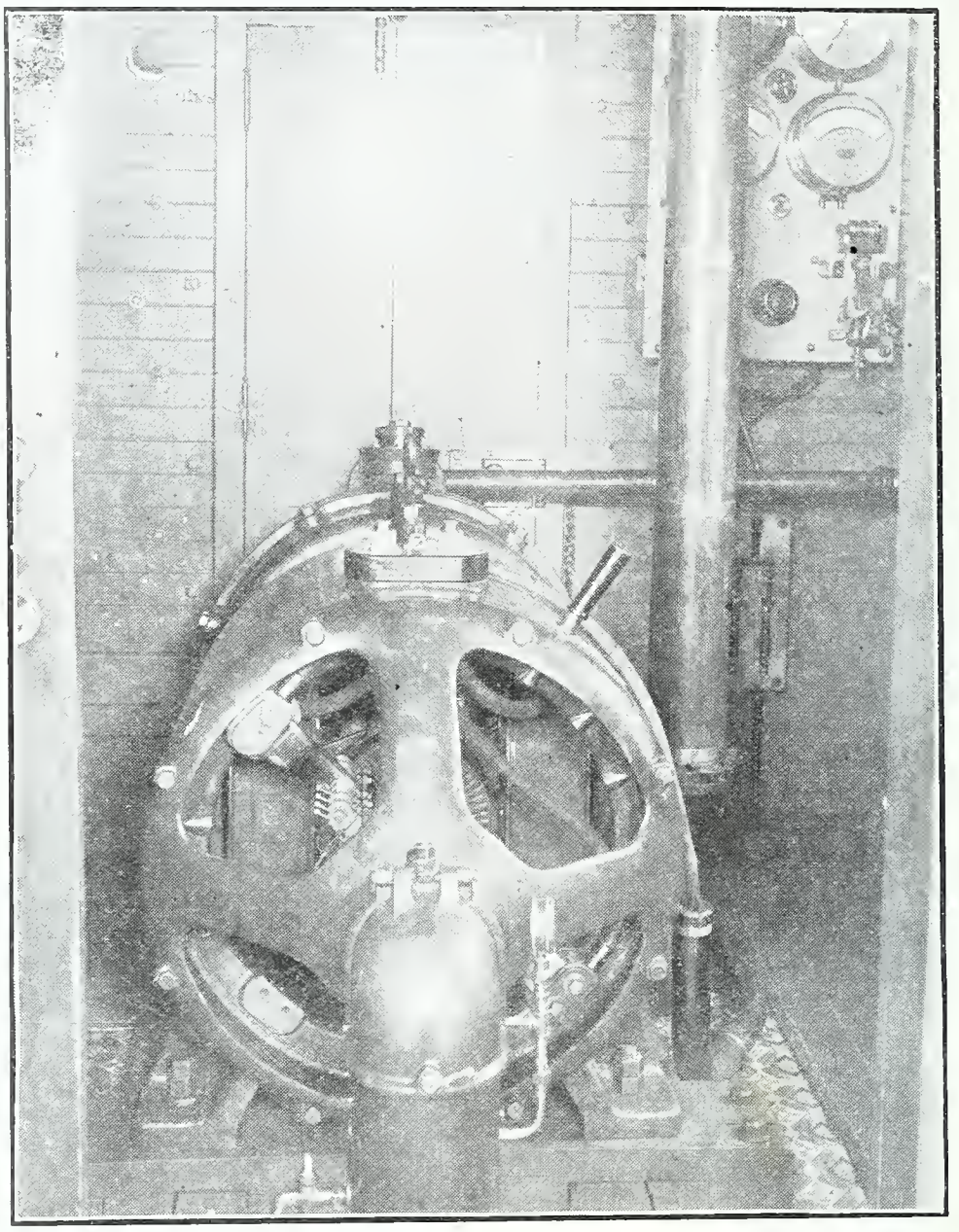
One of the important European car axle crane lighting systems is that of Aichele, installed by Brown Boveri Company Ltd., of Baden, Switzerland. The following description of the Aichele systems given by these Swiss engineers, is of more than passing interest.

"In the early stages of electrical enterprise trials were made to light trains by electricity. Many systems were introduced for this purpose, but not one of them stood the complete test or fulfilled the requirements for successful working. The demands of such a lighting plant working under quite abnormal conditions, especially with regard to its automatic operation, are so high and manifold, that in spite of the superior perfected guidance which the up-to-date knowledge of electro-technology offers, no satisfactory practicable solution of the problem in question was found. The solution of the problem, in a purely technical manner, does not however suffice to make such a system completely suitable for general application. It must fulfill other requirements, such as uniformity and interchangeability of the separate parts, facility in erection, minimum amount of attendance, and absolute reliability in operation.

"The lighting system of Messrs Brown Boveri & Co., Ltd., possesses all the qualities enumerated above, both as regards technical as well as mechanical design.

"Every separate car in this system is equipped with a complete lighting plant which consists of a dynamo, a storage battery of a few cells, a regulating apparatus, and the necessary wiring and lamps. The system lends itself just as well to ordinary express trains as to international through passenger trains. The only parts visible in the car are the wiring and lamps.

"The dynamo, which is suspended from the car truck and driven through a belt from one side of the axle, is a two horsepower direct current shunt wound machine, completely enclosed in a cast steel case in order to prevent dust or moisture getting in. Its speed ratio is constant, *i. e.* the speed at which it runs is directly proportional to that of the train, consequently no defective mechanical contrivance, made to operate when speed becomes excessive, such as a belt slipping arrangement, is needed. The change in polarity is caused by the change in direction of rotation, and is automatically brought about in the usual way, either by raising the brushes and replacing them automatically with a new set, or by allowing them to slip around on the collector."



TURBO-GENERATOR SET INSTALLED IN C. B. & Q. R. R. BAGGAGE CAR.

A Powerful Explosive.

Maximite—so named from its inventor Hudson Maxim, who must not be confused with Sir Hiram Maxim, the originator of the Maxim gun—is said to be perhaps the most powerful explosive in existence, being 50 per cent stronger than dynamite. It has some unusual qualities, among others that it does not explode when submitted to a shock, and may be stirred with a white hot iron without danger. Heated in an open vessel it will evaporate like water, and shells are filled with it by simply melting and pouring it in.

Rights of Publishers.

Interesting Decision of the U. S. Supreme Court.

In deciding the case of the United Dictionary Company against the Merriam Company, involving the question of copyright of a certain dictionary, in favor of the Merriam Company, the Supreme Court of the United States recently dealt with the question whether one publisher who publishes in the United States a copyrighted book containing due notice of copyright can be protected against infringement if he publishes the same book in another country, omitting the notice of copyright in the United States, if he uses in the other country the plates for which the types were set in this country. The Merriams pursued this course with the work of which they are the publishers, and when the United Dictionary Company undertook to reproduce the work from a copy bought in England, where the Merriams published their foreign edition, the latter company sought to enjoin such a course. The suit was brought in the United States circuit court for northern district of Illinois, which granted a temporary injunction to permit the settlement of the case by the Supreme Court, and at the same time dismissed the bill. The U. S. circuit court of appeals affirmed the verdict and the syllabus of its decision appears on page 5 of this issue. The opinion was delivered by Justice Holmes and affirmed the decisions of the lower courts.

In the course of his opinion Justice Holmes said:

"It hardly would be argued that because no copyright had been taken out in England, and therefore the reprint there was lawful, an American copyright could be defeated by importing the English book and reprinting from that. It would be even bolder to say that the American author stood worse if in the days before he could get a copyright in England he had made an arrangement with English publishers to secure payment from them. Yet that is the logic of the appellant's case. * * * It may be that in most cases the importation of a pirated English copy of an American book would be unlawful, whereas it is argued that the importation was lawful in the case at bar. The appellee makes a strong argument that the appellant's importation was wrong. But it is hard to see how the right to copy a book, whether lawfully or unlawfully imported, can be affected by the mode in which it got here. The analogies of the law are the other way."

A New Laboratory.

It is doubtful if any of the laboratories maintained by the government for scientific research are more unique in character, and yet bear promise of more important results, than one which has just been established in Washington by the United States Forest Service for investigating the structure of commercially important woods.

Laymen will not understand the significance of the proposed investigations carried on in its laboratory so quickly as architects, builders and other wood users, who in these days of growing scarcity of the more valuable woods are seriously perplexed in identifying substitutes. Mistakes of this kind in identification have, in the last few years, in several instances, meant the loss of thousands of dollars, and many embarassing law suits.

Nearly any user of lumber can recognize, and name off-hand, all the usual trees of the forest when he sees them growing, and not much difficulty is encountered in identifying the common kinds of lumber in a mill yard, because he knows the few trees from which the yard lumber comes. But common kinds are growing scarce, and woods not often cut heretofore, are appearing in the markets. The most experienced men are sometimes puzzled when they try to identify them, and persons with less experience have still more trouble. Is a certain wood gum or elm? Is another cucumber, linn, or poplar? Is a stick sugar maple or red maple? Doubts may arise whether a piece is hemlock or spruce, or whether it is lodgepole pine or fir, or whether a shingle is cypress or cedar. A dealer may buy red oak and suspect that he his getting something else. There are thirty or more important species of oak. The best lumber dealer might not know which is which in the lumber pile, or if he knows, he might not know how to prove it.

Many of these woods look alike, even to the trained eye of the millman or the builder, and yet they are widely different in value for certain purposes, and it is of the greatest importance to be able to distinguish them quickly and certainly. Again, a new wood may come to a man's notice for the first time, and it may be necessary for him to decide what it is and what it is worth.

The government has been helping individual lumber users for some time, but the facilities have not been near so complete as they are now. It is to meet such needs and answer such questions, that the Forest Service has established the laboratory, and placed it in charge of a trained dendrologist. Architects, lumbermen, manufacturers and makers of woodware are already sending in samples of wood for identification, and asking if there are not some structural characters by means of which such woods may be conveniently separated for relative species having greater or less value for some specific purpose.

The laboratory will investigate in a practical way. The structure of the woods, sections lengthwise and crosswise will be studied, so as to separate by structure alone the various species of a genus. Analytical keys to the trees of each group will be worked out. These will be based on the arrangement and character of the pores discernible to the naked eye, or by a hand lens.

The results will be published from time to time with good illustrations and placed at the disposal of lumber users. After all the important groups of wood, such as oaks, pines and firs, have been studied and the results published separately, the several monographs will be collected and published in one volume.

A work of this character has long been in demand by architects, builders and other users of lumber. It will, in most cases, enable even a non-technically trained man to determine quite readily the wood he deals with by means of an ordinary hand lens, and by comparing the wood in question with the photographs of cross and long sections given in these monographs.

The Automatic Typewriter.

One of the newest and more useful of office appliances is the automatic typewriter. This machine will produce any number of letters in the original form. It will fill in name and address, and will do the work more accurately than the ordinary typewriter. Most remarkable is the speed at which letters are written; 5,000 words have been turned out by this machine in a minute and a fraction.

All this sounds wonderful enough, but something greater is promised. A machine is in preparation which is designed to eliminate the stenographer and transcribe from dictation a business man's mail without any attention other than turning on the electric current. The machine will automatically break the circuit and stop working when all of the letters have been written. This sounds like a fairy tale or a press agent's yarn—for how can the most marvelous machinery be expected to spell out words? But it is asserted that even this difficulty has been overcome, and that the machine is actually at work and will shortly be manufactured for general use.

In appearance the automatic machine first referred to above resembles an ordinary typewriter, except for the fact that it is somewhat larger than the more familiar models. As shown in a recent exhibit in Madison Square Garden, New York, in operation, the keys strike against the paper in front of the platen, exactly as though it were being worked by fingers. The speed obtainable is fifty times as great, one reason for this being that the machine will write from left to right as well as from right to left. This permits a continuous line movement.

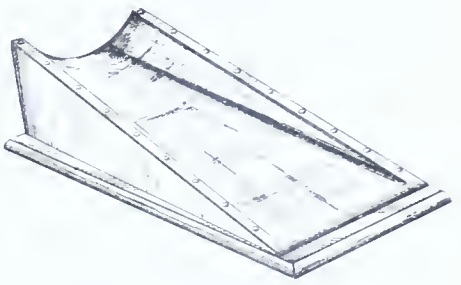
Lines may be justified like type, which is impossible on ordinary typewriters. Names and addresses may be changed at will. A circular letter to any number of people may be put on the machine, the current turned on, and it will write until the work is done. When the last letter is finished, a mechanical device will ring the bell and the mechanism will stop.

It has been the desire of manufacturers for years to produce circular letters that should have the appearance of originals, but they have always fallen short, the drawback being that in order to get the name and address it was necessary to insert the letters in a typewriter after they were written, and fill in the same. The difference in the density of the color of the ribbon and the impossibility of lining up the letter and the address perfectly have been a give away in most cases. Besides the process has been slow and expensive. This new device solves every problem, and goes further in making every letter an original.

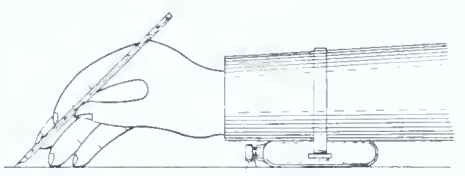
The other machine for which such wonders are promised allows a business man to dictate his letters at night, and have them already for him the next morning. A device similar in appearance to the phonograph, except that it uses a paper record instead of one of rubber or wax, receives the impression and records it as it goes along. When the record is placed on the transcribing apparatus, the machine writes in the same way that a stenographer would.

WANTED—AN ARM REST FOR PENMEN.

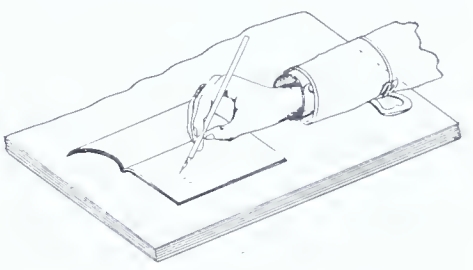
In spite of the multiplicity of inventions, which would seem to cover all possible forms of apparatus, there are still many openings for new and clever devices. Some of the simplest appliances in daily use are not satisfactory—mere makeshifts, indeed, employed only in default of something better. Among many other much needed articles may be mentioned an arm rest for book-keepers, telegraph operators and those who are obliged to use a pen for hours daily and are threatened with that nightmare of



penmen, writers' cramp. Various appliances for this purpose have already been patented. One of these is a frame with triangular sides, raised at one end and suspending a leather cushion. The arm is designed to rest in this cushion, which forms a sort of groove, the elbow being on the table and wrist at a point several inches above it, so that free movement of the hand is per-



mitted. The muscles of the forearm are held from moving by the action of the cushion, so that paralysis of these muscles is avoided. A similar device consists of a pneumatic cushion, which may be attached to the arm by straps and may be worn inside or outside of the coat sleeve. Still another involves the use of a sheet metal plate, arched in the centre and



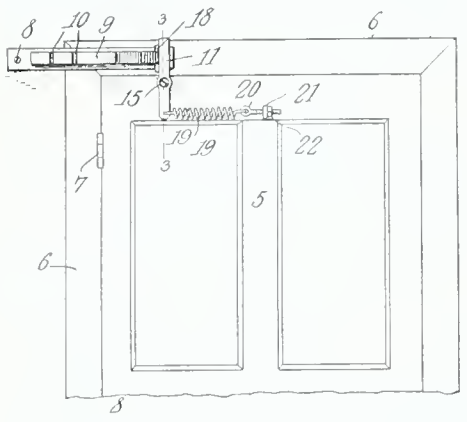
having attached thereto two pieces of metal, bent upward to form a socket. All these are meant to hold the weight of the hand from the desk, and so lessen the tension on the arm muscles. None of these devices, however, seem to quite meet the requirements of penmen. The INVENTIVE AGE has recently received a request for some appliance which will answer this purpose. Here is a chance for the ingenious.

CLEVER NEW PATENTS.

Adjustable Door Check.—Gin Saw Gummer.—Artificial Veneer.

Adjustable Door Check.

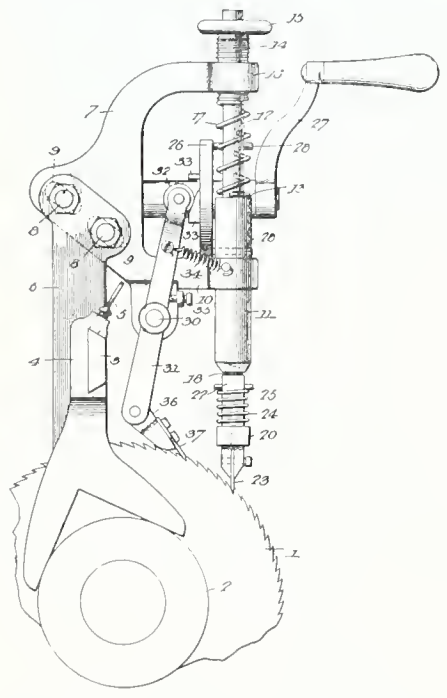
A simple and inexpensive device that can be readily applied to any swinging door for holding it in different open positions, or closed, has been patented by Henry W. Schiermeyer, of Beatrice, Nebr. A semi-circular rack plate 9 is fastened to the door frame 6, above the door, by screws 8.



Pivotally mounted between its ends on the door is a lever 11, the pivot being a screw 15. The upper arm of the lever has a rubber or yielding dog 18 that is arranged to enter into any of a series of notches 10, formed in the rack plate 9. A spring 19, secured to the door and to the lower arm of the lever, serves to yieldingly urge the dog 18 into the notches. With this construction, if the door is moved, the rubber dog moves into and out of the notches; but when engaged in any of such notches, it will have a sufficient locking action to hold the door against accidental movement.

Gin Saw Gummer.

Mr. Ezra Allen Frantz, of Weatherford, Texas, has patented a new gin saw gummer that possesses several features of a distinctive nature. As illustrated in the accompanying view, brackets 4 are employed that rest upon spacing collars 2 interposed be-

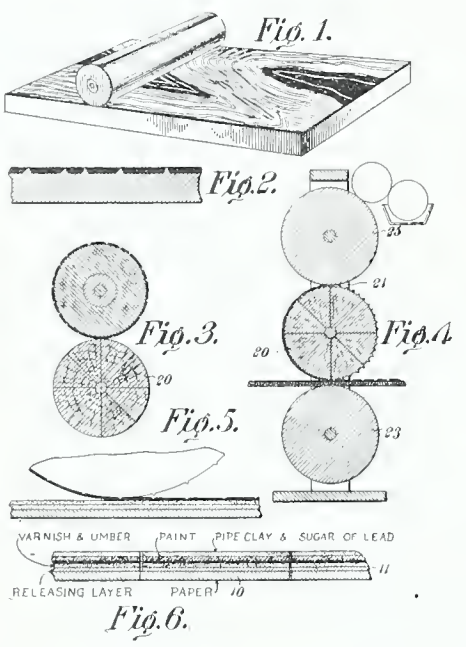


tween the saws 1. These brackets adjustably support a cross bar 3 having a standard 6, on the upper end of which is adjustably mounted, by means of bolts 8, a supporting frame 7. A depending bracket 20, suspended from the frame, carries the gumming blade 23, which is detachably mounted in a vertically reciprocatory stem 22 yieldingly supported by a spring 24. An operating plunger or hammer 11 is vertically slidable above the stem 22, and operates on the same to direct it downwardly, and thus carry the gumming blade or chisel 23 into engagement with the saw 1. The plunger 11 is forced downwardly by a spring 17, and means are provided for elevating the plunger against the action of the spring, consisting of a rotary shaft having a handle crank 27 and provided with a disk 26 having pins 28 that engage in a notch in one side of the plunger. Thus, upon the elevation of the handle crank, it will be evident that the pins are successively engaged in the notch, elevating the plunger and then releasing it. Upon this release, the plunger is forced downwardly, striking the stem 24 and driving the gumming blade 23 into engagement with the saw. Automatic feeding means for the saw is also employed. This feeding means consists of a lever 31 fulcrumed between its ends, as shown at 30, the lower end of the lever having a dog 36 and 37 pivoted thereto, and operating on the teeth of the saw. The upper end is connected to a return spring 34, and has a roller 32, which is operated by a cam 33 on the disk 26. Instead of the chisel 23, a circular gumming instrument may be employed, so that when one portion of the edge of the circular tool becomes worn, it may be revolved to bring a fresh portion into operation.

Artificial Veneer.

Christain Tangenberg, of Chicago, Ill. has devised a novel artificial veneer, and the method of producing the same. In making the veneer, a flexible foundation 10 is employed, in the form of a sheet of paper. This foundation is coated on one face with a layer 11 on which the veneer is built up, and this layer, which forms a connection between the veneer proper and the foundation, is made of material which will permit the ready separation of the paper after the latter has been softened by moisture. The layer 11 is preferably formed of a mixture of one half glue and one half carrageen (*Chondrus crispus.*) After this layer, which may be called the releaser, has dried, there is applied to this releaser a coat of elastic varnish, and the latter is allowed to dry. On this coat of elastic varnish, an imitation of wood grain or marble is produced in the following manner.

In order to produce the wood graining or marbleizing effect by machinery, provision is made for securing a transfer from natural surfaces. To imitate oak graining or wood of any coarse grain, a board of the desired character is first planed and sandpapered, and then is coated with a dark filler. When this filler has partly dried, the surface is gone over with a scraper. Over this surface is then passed a roller made of glue, glycerin and molasses or other suitable material, and in passing this roller over the board, the filler which remains in the surface and slightly below the projecting portion of the grain which has been cleaned by the scraper, is taken up by the roller. This imitation is now transferred from



the soft roller to a roller 20 that is made of close-grained wood, such for instance as hard maple, gum or beech. This wooden roller is so constructed that the outside of the roller is of end wood, so that the roller cannot shrink more on one side than on the other, or become distorted. This roller is painted a light color, and is brought into contact with the soft impression roller, the two rollers being rotated and the filler being transferred from the soft roller to the light surface of the wooden roller. Having thus prepared the wooden roller, all of the surface of the latter that is coated by the transferred filler is cut away, leaving the grain alone to project. This being end wood, will present sharp and durable edges. The paper having been prepared by the application of the releasing layer, and the coat of varnish 11, may be further provided with a transparent coat, such for instance as raw sienna or umber. The wooden grain roller is then mounted in a frame 21, at a point above a roller 23 that is provided with a covering of rubber or other yielding material, and above the wooden roller is arranged an inking roller 25, which may be formed of any suitable material that will carry ink. This roller by coming into contact with the engraved roller, will ink the latter, and when the prepared paper 10 is placed between the lower roller and the engraved roller, and the rollers are turned, an imitation will be transferred from the engraved roller to the varnish coat on the paper. Over this a coat of paint is applied, the latter serving the same purpose as the ground coat for ordinary graining or marbleizing by hand. In this coat of paint, a slow drying oil is used to prevent the veneer from becoming brittle. Finally an additional coat, consisting of a solution of pipe clay and sugar of lead, is added. This latter layer serves two purposes, namely,—the pipe clay prevents the surface of the artificial veneer from adhering to any of the surfaces with which it may come into contact, so that it will permit of the rolling of the veneer in order that the same may be conveniently carried and handled; and the sugar of lead will promote the drying of the veneer after it has been applied to any surface. On applying this artificial veneer, the surface to be treated is given a coat of varnish paint of a very adhesive nature. The latter is allowed to dry until it has a strong sticky surface. The artificial veneer is then placed over this surface and carefully rolled, in order to drive out all the air bubbles between the veneer and surface. The paper is then thoroughy saturated with warm water and is removed. Where the veneer is made in large sheets, the sheets may be provided with small perforations to permit the more ready escape of the air.

PATENTS

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

OGILVIE v. G. & C. MERRIAM CO. G. & C. MERRIAM CO. v. OGILVIE.

(Circuit Court, D. Massachusetts. January 9, 1907. 149 F. R. p. 858.)

1. COPYRIGHTS—NAME OF BOOK—EXPIRATION OF COPYRIGHT—EFFECT.

Where defendants procured a copyright on a dictionary in 1847, which was published under the name "Webster's Unabridged Dictionary," on the expiration of the copyright both the work and the generic name "Webster" became public property.

2. TRADE-MARKS AND TRADE-NAMES—COPYRIGHTED BOOKS—EXPIRATION OF COPYRIGHT—USE OF NAME.

Where the name "Webster," is applied to dictionaries, referred to a publication copyrighted in 1847 under the name "Webster's Unabridged Dictionary," and also acquired a secondary meaning, indicating to the public a particular book published and sold by defendant, who owned the copyright, on the expiration of the copyright complainant, though entitled to use the word "Webster" as applied to a reprint of the dictionary published by him, must so use it as to unmistakably inform the public that his book is not that published by defendant.

3. SAME—EVIDENCE.

On the expiration of the copyright on Websters Unabridged Dictionary, complainant started to publish a dictionary which was a reprint of, and founded on, the original, and which he called "Webster's Dictionary" or "Webster's Imperial Dictionary." On the back or cover of complainant's book was printed complainant's name "George W. Ogilvie," and upon the title page was printed "George W. Ogilvie, Publisher." Held that, as there was no trade-mark in the ordinary form and size of the book, complainant had done all that the law required to distinguish his book from dictionaries published by defendants under the name "Webster's International Dictionary."

4. SAME — UNLAWFUL COMPETITION — ADVERTISING.

Where, after the expiration of a copyright on Webster's Unabridged Dictionary, complainant published a dictionary called "Webster's Dictionary" or "Webster's Imperial Dictionary," which he advertised by misleading circulars, intending to convey the impression that complainant's book was a new edition of the dictionary published by defendant company, and was the successor of a later dictionary published by defendants known as "Webster's International Dictionary," complainant having taken portions of the printed matter in the circulars and advertisements of the International Dictionary and inserted them in his circulars and advertisements, he was guilty of unfair competition.

GOPSILL et al. v. C. E. HOWE CO.

(Circuit Court, E. D. Pennsylvania. January 10, 1907. 149 F. R. p. 905.)

COPYRIGHT—SUIT FOR INFRINGEMENT—PRELIMINARY INJUNCTION.

The showing on a motion for a preliminary injunction to restrain alleged infringement of complainant's copyrighted directory held not to warrant the granting of such injunction, but sufficient to make it proper to require defendant to give a bond for the payment of any damages complainant might recover.

CLAY et al. v. KLINE.

(Circuit Court, S. D. New York. October 8, 1906. 149 F. R. p. 912.)

TRADE-MARKS AND TRADE-NAMES—UNFAIR COMPETITION — SIMULATION OF CIGAR BANDS.

A preliminary injunction granted restraining defendant from using upon individual cigars of panatella shape, bands simulating those of complainant in shape and colors.

BOWERS v. LAKE SUPERIOR CONTRACTING & DREDGING CO.

(Circuit Court of Appeals, Eighth Circuit. November 21, 1906. 149 F. R. p. 983.)

1. PATENTS—LICENSES—ASSIGNABILITY.

A license to use a patented invention that does not contain words importing assignability is a grant of a mere personal right to the licensee, which does not pass to the licensee's heirs or representatives, and which cannot be transferred to another without the express consent of the licensor.

2. SAME—UNASSIGNABLE LICENSE—CONDUCT OF PARTIES.

A continuing assignable quality may be given to a license to use a patented invention originally unassignable, by facts and circumstances and the conduct of the parties during the continuance of the license.

3. SAME—ASSIGNMENT.

Plaintiff executed a license authorizing B. to use certain patented inventions in connection with a hydraulic dredge, on payment of certain royalties. This license was not assignable, and after certain royalties had become due and were unpaid B. requested certain changes in the contract, including the insertion of words authorizing an assignment, which plaintiff agreed to make on B. sending a draft for the royalties then due, with accrued interest. B. did not pay such interest, however, and was never notified that it had been waived: but on B's death his executrix continued to operate the dredge and another dredge purchased, which also contained certain of the patented inventions, and paid royalties thereon, after which she transferred the dredges to defendant corporation under a bill of sale passing the entire dredging plant, business, and contracts, and all licenses to practice or enjoy patented inventions, together with the license papers. Defendant, with knowledge that executrix had been operating under the license and that she asserted a right to transfer and had made manual delivery thereof, continued to operate the dredge and patented appliances without disavowal of responsibility, or repudiating responsibility for royalties, which plaintiff thereafter demanded. Held, that defendant should be regarded as a licensee and as such was liable for royalties.

4. SAME—ROYALTIES—AMOUNT.

Plaintiff executed an unassignable license, authorizing B. to use certain patents on dredging machines which had been installed on a hydraulic dredge known as the "West Superior"; B. agreeing to pay specified royalties therefor. B. thereafter applied to have the license made assignable, and for reduction of the royalty rate, which plaintiff refused to do unless B. paid certain interest on past-due royalties and equipped another dredge of a specified capacity. B. performed neither of these conditions, but later purchased a dredge containing certain of the patented inventions which had been emancipated from further payment of royalties, but which was scarcely half the capacity required by plaintiff in his offer to reduce, after which both B. and his executrix paid royalties at the reduced rate until the executrix transferred all the dredges, licenses, etc., to defendant corporation with plaintiff's consent. Held, that there was no valid contract for the reduction of the royalty rate, and that defendant was therefore liable only for royalties on the work done by the original dredge at the price originally fixed in the license.

MURRAY CO. v. CONTINENTAL GIN COMPANY.

(Circuit Court of Appeals, Third Circuit. January 6, 1907. 149 F. R. p. 989.)

1. PATENTS—ASSIGNMENTS – ACKNOWLEDGMENT.

The acknowledgment of an assignment of a patent relates to the date of the assignment.

2. SAME — INFRINGEMENT — FEEDERS FOR COTTON GIN.

The Murray patent, No. 472,607, for an improvement in apparatus for elevating, distributing, and feeding seed cotton to gins by pneumatic action, the principal feature of which is an automatic valve produced by the cotton itself whenever it becomes chocked in a chute, which shuts off the suction, and the delivery of cotton to that particular chute until the stoppage is overcome, was not anticipated, and, while the elements of the machine are old, discloses a new and patentable combination which produces new and decidedly useful result. Also held infringed as to claims 1, 2, 9, and 12.

3. SAME.

The Murray patent, No. 644,532, for improvements in cotton elevators and gin feeders, is void for anticipation.

MOTSINGER DEVICE MFG. CO. v. HENDRICKS NOVELTY CO.

(Circuit Court of Appeals, Seventh Circuit. Nov. 9, 1906. 149 F. R. p. 995.)

PATENTS — INFRINGEMENT — CONTROLLER FOR SPARK GENERATORS.

The Motsinger patent, No. 642,869 for a controlling means for spark generators, adapted to maintain a constant speed of a driven shaft in a gas engine by means of a peripheral frictional contact between a driving wheel and a pulley on such shaft, and means whereby the grip of one wheel upon the other is automatically so varied that, though the driving wheel may rapidly change from low to high speed, the speed of the driven pulley will not substantially change, in view of the prior mechanical art in which all the means employed were old, is not a pioneer patent, and must be limited to the substantial construction shown. As so limited held not infringed.

TILESTON v. VAUGHAN et al.

(Circuit Court of Appeals, Seventh Circuit. October 12, 1906. 149 F. R. p. 999.)

PATENTS—INVENTION—EYE-GUARDS.

The Tileston patent, No. 513,603, for a flexible ventilated eye-guard, is void for anticipation.

CLARK et al. v. HARMON S. PALMER HOLLOW CONCRETE BLDG. BLOCK CO.

(Circuit Court of Appeals, Seventh Circuit. November 15, 1906. 149 F. R. p. 1001.)

PATENTS — ANTICIPATION — DESIGN FOR BUILDING STONE.

The Palmer design patent, No. 36,806, for a design for artificial building blocks, showing the upper portion of the block having a rock face and the lower part smooth, is void for anticipation and lack of invention; it being shown without contradiction that houses still standing were built, prior to the application for the patent, of alternate layers of rock-face and smooth-face stone, presenting substantially the same appearance to the eye as a building of stone made after the design of the patent.

NATIONAL GLASS CO. et al. v. UNITED STATES GLASS CO. et al.

(Circuit Court of Appeals, Third Circuit. January 16, 1907. 149 F. R. p. 1003.)

PATENTS—INFRINGEMENT — FURNACES FOR REHEATING GLASSWARE.

The Schulze-Berge patent No. 411,131, and the Caldwell patent, No. 442,855, both for furnaces for reheating or fire-finishing glassware, as limited by construction in prior suits to the precise mechanism described, held not infringed by a furnace which does not have a laterally projecting floor, which is an essential feature of both.

DOWNES v. TETER-HEANY DEVELOPMENT COMPANY.

(Circuit Court of Appeals, Third Circuit. January 21, 1907. 150 F. R. p. 122.)

1. PATENTS — INFRINGEMENT— PATENT FOR PROCESS AND PRODUCT.

Where a patent includes claims for a process and also for the product of such process, the latter are to be construed in connection with, and are limited in scope by, the former, and are not infringed unless the process claims are also infringed.

2. SAME—INSULATION OF ELECTRICAL CONDUCTORS.

The Downes patent, No. 534,785, for a process for applying asbestos insulation to electrical conductors and the resulting product, the essential features of the process being the carding or brushing of the asbestos yarn or strand after it has been wound on the wires, in order to raise a nap and lay the fibers in one direction, construed, and held not infringed.

3. SAME.

The Downes patent, No. 709,001, for an improvement in the process of applying asbestos insulation to electrical conductors, which consists essentially in subjecting the insulation after its application to pressure alternately applied and released, in order to avoid its injury, in view of the prior art, must be limited to the means described for applying such pressure, which is by swaging, and is not infringed by a process in which the pressure is alternately applied and released by the use of rollers or dies.

NEW ENGLAND MOTOR CO. v. B. F. STURTEVANT CO.

(Circuit Court of Appeals, Second Circuit. Dec. 4, 1906. 150 F. R. p. 131.)

1. PATENTS–ANTICIPATION–MOTOR FRAMES.

The Burke patent, No. 631,518, for an improvement in frames for electric motors or generators, which consists in providing a frame or cradle in which the armature is mounted, and having bearings for the two ends of the axle, so as to preserve a perfect alignment, is void for anticipation by certain motors constructed for operating elevators which were in use prior to the application, and in which a similar cradle was used.

2. SAME–ANTICIPATION–BURDEN OF PROOF.

A public knowledge and use of a device by others prior to the application for a patent therefor being shown, the burden is cast upon the patentee to furnish convincing proof that the anticipation was anticipated by him in making the invention.

3. SAME.

The Bliss patent, No. 669,574, for a frame for electric motors is void for anticipation.

MAGINN v. STANDARD EQUIPMENT COMPANY.

(Circuit Court of Appeals, Seventh Circuit. October 2, 1906. 149 F. R. p. 139.)

1. JUDGMENTS—AMENDMENT OF DECREE—PRESUMPTION OF VALIDITY.

An amendment of a decree by a court of general jurisdiction is presumably within its powers and made before the expiration of the term at which the cause was finally disposed of; and such an amendment of a decree in a suit by a wife for separate maintenance, merely correcting the numbers of certain letters patent, an interest in which was decreed to the wife, and as to which numbers no issue was taken, made on motion to correct the decree to conform to the proofs, is not void nor subject to collateral attack, although entered at a term subsequent to the decree, where the record does not show affirmatively that such decree was a final disposition of the case.

2. SAME — DESCRIPTION OF PROPERTY — SUFFICIENCY— PATENTS—TRANSFER OF TITLE BY DECREE.

A patent is sufficiently identified in a decree by giving the number and name of the patentee, and the decree is not rendered void for uncertainty because the description of the invention is not given in the language of the title head of the patent, which is merely used for the purposes of classification in the Patent Office.

GERMER STOVE CO. v. ART STOVE CO.

(Circuit Court of Appeals, Sixth Circuit. January 18, 1907. 150 F. R. p. 141.)

1. PATENTS—INFRINGEMENT — STOVE LININGS.

The Condit patent, No. 358,545, for a lining for stoves or furnaces, is limited by the prior art to a lining having vertical air cells therein, open at the bottom below the grate and closed at the top, and having narrow slit openings from such cells into the fire chamber. As so limited held not infringed.

2. SAME—AGGREGATION OF OLD ELEMENTS —INDEFINITENESS.

The Germer patent, No. 587,368, for improvements in fire pots and grates for stoves, claim 1, which is for fire pot having vertical air passages in the walls thereof and vertical slits connecting the same with the inside of the fire pot in combination with a substantially closed grate, is void as not disclosing a true combination, but a mere aggregation of old elements, each performing its old function independently of the other. Claim 2, which is for the same fire pot in combination with a supporting ring at the top and a grate having the openings therein so constructed as to admit "but a small portion" of the air necessary for combustion therethrough, is void for indefiniteness of description as to the third element.

3. TRADE-MARKS AND TRADE-NAMES–RIGHT TO PROTECTION IN USE OF NAME—UNFAIR COMPETITION.

The words "XX Century Fire Pot," used to designate a patented fire pot both by complainant and another concern, each of which made and sold furnaces or stoves containing such fire pot, cannot be protected as a trade-name of complainants, even if such words were capable of being so monopolized and used to indicate the origin of the article; nor, where such words were not placed upon the stoves of complainant, but merely used in its advertisements, the stoves having another name, can a defendant be charged with unfair competition in selling a stove under the name "Twentieth Century Laurel," with its name as maker plainly shown thereon.

VICTOR TALKING MACH. CO. et al. v. LEEDS & CATLIN CO.

(Circuit Court, S. D. New York. January 5, 1907. 150 F. R. p. 147.)

PATENTS—CONTRIBUTORY INFRINGEMENT—VIOLATION OF INJUNCTION.

The sale, by a defendant, which has been enjoined from infringing a patent for a sound-producing apparatus of a talking machine, of records which are capable of use with the other elements of the patented apparatus, and which are intended to be and are so used by purchasers of such apparatus from complainent, constitutes a contributory infringement and a violation of the injunction.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Elvis E. Drake, Nashville, Tenn. Head Block for Hay Presses.—Heretofore head blocks have been provided with V-shaped grooves to receive the wires for tying up the bales, but difficulty has been experienced in passing the wires through the grooves while the baling press is in operation, as the sharp edges of the wires frequently embedded themselves either in the wood of the head block or in the bale, and it then becomes necessary to withdraw the wire. The object of the present invention is to provide a head block having grooves through which the wires may be rapidly passed and in which the wires will be retained until the bale is tied. The wire-receiving groove of the head block has outwardly converging side walls, and a metallic lining, which is arranged within the groove, has corresponding converging resilient side walls, forming wire engaging jaws. The jaws constrict the longitudinal opening or mouth of the groove to a size less than the diameter of the wire and are expansible to permit the wire to be readily removed.

William M. Carriker, Irving, Ill. Neck Yoke.—It is the aim of the present invention to provide a neck yoke designed for use on all kinds of vehicles, mowers and binders, and adapted to permit the neck yoke to be readily applied to, and securely connected with a tongue or pole at the extreme end thereof, so that the latter will not project and catch into a fence, should the team be hitched to one of the posts. The device for connecting the neck yoke to the tongue or pole includes a neck yoke ring, an arched coupling member pivoted at opposite sides to the ring, and an upper coupling member pivoted to the top of the arched coupling member to permit the neck yoke to swing horizontally, and also pivoted to the neck yoke for enabling the latter to swing transversely of the pole. The pole is equipped with a tip having an annular rib, which forms a stop for the neck yoke ring, and the latter is locked on the pole tip by means of catches located in advance of the rib.

Ferdinand H. Lange, Jr., Wilkes Barre, Pa. Sliding Door Hanger.—The device of this patent is designed for use in houses, barns and elsewhere, and is adjustable to fit doors of different sizes. It enables the door to slide noiselessly, and effectually prevents the same from jumping the track. It includes a hollow track provided at the top with a slot, a supporting wheel peripherally grooved to conform to the configuration of the track, and having a central projecting annular flange, extending into the groove and fitting against the interior of the track at the bottom thereof, and hanger rods located at opposite sides of the track and extending from the wheel to the outer portions of the door.

Ezra S. Pond, Toledo, Ohio. Garbage Receptacle.—This patent covers a garbage can having an interior hopper through which the garbage passes in a continuous stream to cause a downward draft of air, that will continue during the entire discharge of garbage from the hopper to the interior of the garbage can. The garbage can comprises a rectangular receptacle, a hopper of frusto-pyramidal shape fitted within and hinged to the top of the receptacle, and having marginal flanges resting upon the upper edges of the receptacle, a lid forming a cover for both the hopper and the receptacle, a valve normally closing the bottom of the hopper and carried by the same in the swinging movement thereof, and operating means for the valve also carried by the hopper. The receptacle is provided at one side with an opening, and is equipped with a hinged door for normally covering the opening. The door is provided with segmental sides, arranged to slide outside of, and in close engagement with the side walls of the receptacle, and having their rear edges bent outward to form flanges for engaging guides of the sides of the receptacle. The door swings downward and enables the contents of the receptacle to be readily removed.

Emma E. Bixler, Easton, Pa. Metal Window Box for Flowers. — The present invention relates to a highly ornamental artistic window box, designed to decorate a window and to receive growing plants of various kinds. The window box is adapted to provide the proper drainage, so that the plants will be maintained in a healthy condition, and it is equipped with a drain pan for catching the superfluous water. It embraces a metallic box provided with supporting legs, and having a longitudinally disposed drain pipe or tube located at the outer portion of the box in a plane above the lower end of the legs, whereby it is maintained out of contact with the window sill. The bottom of the box is provided at intervals with drain apertures, which communicate with the interior of the drain pipe. The drain pipe discharges into a drip pan, which is slidably mounted in guides or ways, provision being made for a lateral movement of the box to disengage it from the discharge end of the drain pipe.

Martin J. Halliburton, Portageville, Mo., inventor; Henry G. Illig, same place, assignee. Bridle.—The object of the present invention is to provide a bridle adapted to be used in the ordinary manner, and capable of being readily changed for hitching or leading an animal, and for controlling vicious and stubborn animals. The bridle includes reins detachably connected with the bit, and hitching and leading cords operable independently of the bit and loosely mounted on the sides of the bridle, the leading cords being provided at the top of the bridle with ear engaging portions, and having lower portions arranged to be connected with the lines, when the latter are detached from the bridle, whereby the pressure is transferred from the mouth of an animal to its ears, and thus a better control over the animal is obtained.

William M. Rush, Greensburg, Pa. Combined Curtain Stretcher and Clothes Drier.—The invention embodied in this patent obviates the necessity of measuring and squaring the parts, and is adapted to be easily handled by one person. The adjustment of the parts is effected without slotting and weakening the same, and they are adapted to be compactly folded when not in use. The invention includes an extensible lazy tong drier frame, provided with opposite pivotally mounted curtain engaging bars, having projecting curtain engaging devices, and capable of rotation to present such devices for engaging a curtain and also to arrange them out of the way of the clothes, and detachable curtain-engaging bars supported by the clothes drier and co-operating with the curtain-engaging bars thereof. Clamps are provided for securing the curtain-engaging bars in their adjustment.

Charles W. Lurtey, Little Rock, Ark. Tire Valve Stem Protector.—It is the aim of this invention to protect the valve stems from being cut or torn off in case the tire creeps on the rim of the wheel. The invention consists of a tire having inner and outer sections, a valve stem and valve mechanism projecting from the tire, and a stem protector comprising a base plate that is located between the tire sections, said plate being longitudinally and transversely curved, and an open ended sleeve projecting from the base plate and from the tire and surrounding the projecting portion of the valve stem.

Samuel F. Ettinger, Little Rock, Ark., inventor; R. E. Stevenson, A. J. Mercer and Robert A. Furth, same place, assignees. Non-Refillable Bottle.—This patent discloses an ingenious construction adapted, after a bottle has received its original contents, to prevent a liquid from being introduced into the same, whereby fraudulent adulteration and refilling is effectually prevented. The neck of the bottle, which is interiorly tapered to form a lower valve seat, is provided in the upper tapered portion with interior screw threads. The lower portion of the neck of the bottle receives a cup-shaped valve, which is confined therein by a tapering exteriorly threaded sleeve, secured in the threaded portion of the neck and provided with a stopper-receiving opening. The lower end of the sleeve is fluted or corrugated to form passages, which permit the liquid to flow freely from the receptacle, when the same is inverted and the valve lies against the sleeve.

John Hancock, Tulsa, Oklahoma. Lawn Swings.—This invention is of the character designed for lawns and the like, wherein the seats are supported on rockers, and the object is to provide a novel, simple and comfortable structure of this sort that is compact, so that it will occupy comparatively little space, and which is so constructed that the occupants can operate the same with ease. The invention consists in the combination with a base, of a rocker seat mounted thereon, a reciprocatory platform also movably supported on the base separately from the rocker seat, and connections between the platform and the seat.

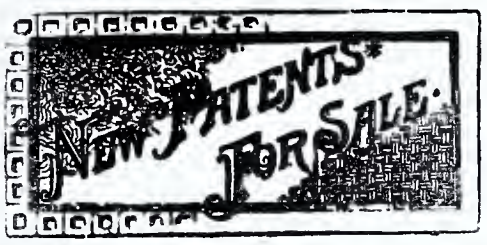
Samuel M. Renn, inventor, Fort Wayne, Ind.; Samuel H. Maurer, assignee, Spencerville, Ind. Cistern Screen and Filter.—The present invention provides a device adapted to be readily applied to a rain spout to screen and filter the rain water before the same is delivered into a cistern. It is adapted to exclude leaves from its interior, and it may be easily taken apart to enable the filtered material to be conveniently cleaned. It embodies a casing, a screen top having an inclined portion, a neck located above the screen top and adapted to fit within the rain spout and provided with an inclined screen, a receptacle having a screen bottom and detachably supported within the casing for holding the filtering material, a screen mounted within the lower portion of the casing at a point below the receptacle for supporting the absorbent filtering material, and a spring interposed between the support for the receptacle and the filtering material to retain the latter on the lower screen.

James M. Ulsh, Lancaster, Pa. Harrows. Four patents.—The harrow of the first invention relates to that class known as the spring tooth harrow, and it is so constructed that the sides or sections of the harrow may accommodate themselves to any unevennesss of the land and ride freely over obstructions. Each harrow section is equipped with runners and tooth bars carrying teeth, the latter being adjustable to regulate the depth of the cut. The harrow includes outer frame members for the individual harrow sections, an inner member common to both sections, the several frame members being independently supported from the ground and flexibly connected to each other, and rotary tooth bars extending in opposite directions from the central frame member and having their axes in intersecting relation therewith.

The object of the second invention is to equip a harrow with a plurality of tooth bars arranged in seetions at opposite sides of the longitudinal center of the harrow, each being equipped with a plurality of teeth arranged to be simultaneously adjusted either vertically or horizontally, the vertical adjustment being effected by the rotation of the tooth bars and designed to regulate the depth of cut, and the horizontal adjustment being effected independently of the tooth bars and designed to present the teeth either edgewise or at an angle to the line of draft, or directly across the line of draft. It comprises a supporting structure, a tooth bar, a bracket carried by the tooth bar and having a bearing lug, a tooth holder having a pair of bearing ears pivoted to the bearing lug, means for securing a tooth in the holder, and an arm extending from the holder to facilitate the adjustment thereof.

The third invention covers a harrow wherein the teeth may be shortened and the cost thereof lessened without impairing their efficiency. It is the aim of this invention to increase the rigidity of the teeth and to so arrange the same that when they are thrown upward out of the ground to clean the harrow, no portion of them will be depressed, and tend to hold in the harrow any accumulated rubbish, whereby the harrow will be more easily cleaned than the harrow having the long spring teeth, which extend both in advance and in rear of the tooth bar, and which are partly depressed when the points of the teeth are thrown upward and forward. The device embodies a tooth bar, a harrow tooth having its top portion arranged beneath the tooth bar with the terminal extended upward at the front of the said bar, said tooth being extended rearwardly and downwardly from the tooth bar, and an inclined fastening device piercing the tooth bar and the top portion of the harrow tooth and extending from the back of the upper portion of the tooth bar to the lower front portion thereof, and having its lower end arranged at the front of the terminal of the upper portion of the harrow tooth, at a point in advance of the bottom of the tooth bar, whereby when pressure is applied to the point of the tooth, the entire strain will be against the bottom of the tooth bar and transversely of the fastening device.

The fourth invention is directed to that class of toothed harrows having automatically adjustable sections to accommodate the harrow to unevenness of land, and its aim is to provide one capable of vertical adjustment to regulate the depth of cut, and to elevate and lower the harrow frame to suit various conditions of soil, and in which there will be an increased clearance capacity by eliminating all parts at the center of the harrow that would tend to accumulate rubbish, and prevent the free passage of the same therethrough. The harrow, which is composed of sections, includes inner and outer frame members, the inner frame member being common to both the sections and rigidly connected with one of the outer frame members, tooth bars journaled on the other outer frame member, and interfitting hinge elements connecting the tooth bar to the inner frame member, one of the elements consisting of a bracket secured to the inner frame member and having projecting ears, and the other element having an eye and provided with a tooth-bar receiving journal.



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WANTED—Want agricultural works in cotton states to manufacture our Bell's sliding hoe cotton chopper Will do work of six men to a stand. Would sell a few state rights. Patented December 3, 1907. Address, John C. Bell, Cartersville, Ga. my

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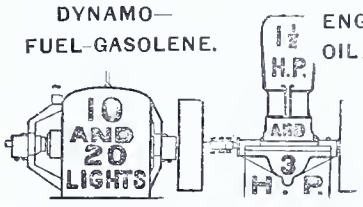
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WASHINGTON, D. C., MARCH 1, 1908.

Proposed Copyright Bill.

Never has a Congressional measure interested the music lovers of our country as much as the proposed copyright bill which is now before both the House and Senate. Delegates from all over the land have been appointed to visit the Capitol in its behalf, and some of our best known composers have been here working for its passage. The special paragraph which occupies the attention of authors is one directed against "canned music" as Sousa calls it—*i. e.* against the use of musical compositions on phonographs, perforated music rolls, etc., without remuneration to the composers. The latter have been much stirred up over the question and have formed an organization of over 5,000 members, reaching from one end of the country to the other. They argue that they are entitled to royalty for the use of their compositions on phonographic records. The phonograph companies, on the other hand, claim that to pay royalties on each song, march or waltz would make these pieces too costly for use on discs and cylinders, except in such a limited way that they would be beyond the reach of many people who now enjoy this music, and receive the educational benefits of it. Another objection urged by the authors is that the records do not properly reproduce the compositions, many of which are not adapted for phonographic use. The same plea, it will be recalled, was made against the introduction of some of Wagner's music into this country. It was the earnest wish of the great composer that his favorite opera, Parsifal, should be sung only in the theatre specially constructed for Wagnerian work at Bayreuth, and nowhere else in the world. To friends of the author, and indeed to Germans generally, it seemed little less than sacriligious to disregard his commands and audaciously produce the opera in New York. And yet the multitude of people who were thus given the opportunity of hearing the marvelous harmonies of this poem in music, did not regret the indifference shown to the wishes of Wagner.

Affairs in the Patent Office.

The report of the Commissioner of Patents for the last fiscal year, recently presented to Congress, offers a vivid picture of the colossal growth of the institution under his control. No parallel to it is to be found in other bureaus of the Government, and it is a source of no small embarassment to the authorities, who find themselves unable to keep pace with the unceasing demands for more working force, and for more space. Years ago the Office outgrew the quarters provided for it and encroached upon those meant for other bureaus, in the great building designed for the use of the Interior Department. Spreading like a tidal wave, it finally elbowed its neighbors out of doors altogether and into adjoining structures, until it now occupies practically all of the space in the building, only a few apartments being reserved for the Secretary of the Interior and his assistants. The next move was to transfer the interesting collection of models, which require a large amount of room, to an outside structure; and still the demand comes for more breathing space for this giant among bureaus. The situation, in regard to the transaction of work itself, is even worse. The number of applications made and of patents granted is growing by leaps and bounds. Over seventy thousand applications, appeals, etc. came up before the Office last year, and the increase in the number of patents granted was upwards of five thousand—which represents, it may be noted, the largest increase in any year since the institution was established. Nor has the recent financial depression affected the volume of business. The Patent Office has always in the past, been very sensitive to any disruption or embarrassment in the commercial world, and the business has fallen off in financial crisis. This was notably true in the period immediately preceding the civil war, and during those years of strife; it was true in the memorable panics of '73, '84 and '93; but so far as last year is concerned, there was nothing in this particular industrial thermometer to indicate that any real depression in business or financial disquietude existed. In fact, much more work came in than could conveniently be handled. The Commissioner reiterates what has been said in previous reports for years—that the business of the bureau is far in arrears. The efforts that have been made from to time to time to catch up—involving extra hours on the part of the clerical force, the giving up of leaves of absence, etc.,—have not been successful. The examiners have been swamped by the flood of new applications, and nothing short of radical action in the enlargement of the working force will be found an effectual remedy.

An increase in the number of clerks employed in classifying patents is also urgently needed. It has been nine years since Congress, recognizing the necessity of this work, made an appropriation for the purpose; but owing to the growth of the general work, very little has so far been accomplished. The number of U. S. patents that have been issued since the passage of the patent law, (including designs, trademarks, etc.) is in the neighborhood of a million. There are also about three million foreign patents of all countries, which are obtained by exchange with the nations that belong to the international industrial union. The total number, it will be seen, is so enormous, and it is growing so rapidly, that some complete system of classification is indispensable in order to allow of a search through them. It is impossible to make an exhaustive search through the mass of patents above described, without a proper classification. This work, the Commissioner points out, should be pushed rapidly on account of the constant changes in the lines of development and the frequent losses of force, which result in a great waste of time and labor. As an illustration, the report cites the class of telegraphy, which it was desired to reclassify. The patents in this class are largely diagrammatic, and most of them must be read in order to understand them. An assistant examiner at $1,600 a year was assigned to this work and he spent a year in reading them. Finding a better opening in outside employment, he then resigned, and was succeeded by another, who also worked about the same length of time, and then received an offer for more remunerative work in private practise. A third man was set to work, with a repetition of the same experience. Over three thousand dollars had now been paid for the acquirement of the necessary knowledge of this art, which was lost to the Office by the resignations of the men, due to insufficient salaries to retain them. This is only one example of what is occuring to a greater or less extent in all the forty-one examining divisions of the Office. Measures should be taken to avoid this loss and to bring all the work of the Office into better shape.

The Commissioner also suggests some amendments to the law relating to appeals of cases rejected within the Office, which would shorten the course of prosecution and facilitate business. To quote from his report:

"Under the present law, appeal lies in ex parte cases from a primary examiner to the Board of Examiners in chief, thence to the Commissioner and from his decision to the court of appeals of the District of Columbia; and in interference cases the course of appeals from the decisions of the examiner of interferences is the same, there being three appeals in each case. It is designed to shorten the course of prosecution by eliminating one of the appeals within the Office—by combining the Commissioner, Assistant Commissioner and Examiners in Chief into an appellate tribunal, any three of whom shall constitute a quorum, to which all appeals shall lie, whether from a primary examiner or from the examiner of interferences, and from which appeals would lie to the Court of Appeals of the District of Columbia.

The present course of appeals is not well adapted to the volume of business which the Office is now called upon to handle, for the following reasons:

1. It imposes on applicants an unnecessary amount of delay and expense. The very purpose of the patent system is to place at the service of the public at as early a date as practicable inventions as they are made, and unnecessary delays affect not only applicants but all interested in the industries to which the inventions relate. One appeal within the Office, together with the appeal to the Court of Appeals of the District of Columbia, would seem to be ample, especally in view of the fact that in a suit on a patent a single appeal takes the case from the trial court to the Court of Appeals. The elimination of one appeal would materially shorten the time required for the ultimate disposal of appealed cases, and effect a considerable saving of expense to applicants.

2. Seetion 4910 provides for an appeal to the Commissioner in person from the Board of Examiners-in-Chief. The work of the Office and the consequent number of appeals has increased to such an extent that it has become difficult, and will soon be impossible, for the Commissioner to give to each case the amount of personal attention proper to its disposal.

3. The Board of Examiners-in-Chief as at present constituted consists of three members, and no provision is made under the present law to supply a temporary vacancy caused by the sickness or absence from other cause of any of the members. The absence of one member often results in an evenly divided Board, with the consequent necessity for a rehearing, and the absence of two members causes an entire suspension of business. With the proposed membership of five, the presence of a quorum of three would be practically assured at all times, which has not been the case in numerous instances in the past, owing to frequent absences of a member of the Board on account of periods of illness of greater or less duration, and also by reason of annual leave and other causes."

A similar amendment to the laws relating to appeals in trademark cases is submitted.

These changes in the course of appeals, says the Commissioner, would not only have the effect of expediting the prosecution of applications on appeal, but would be a saving to the inventors of one appeal fee, the attorneys' fees, and other expenses incident thereto. Furthermore, having but one appeal within the Office in lieu of two would give greater stability to the decisions of the Office tribunals.

Patent Appeals Court.

Measures for the creation of a new Patent Appeals Court have been from time to time discussed in the INVENTIVE AGE. It is to be hoped that the bill recently introduced by Senator Beveridge will have a better fate than its predecessors. It creates a court consisting of five members, which is to be located in Washington, and is to have jurisdiction to determine appeals and writs of error from final judgments and decrees in the circuit courts of the United States in patent cases. The membership of the court is to consist of one president judge, to be appointed by the President, and four judges to be appointed by the Supreme

Court. Decisions of this court may be reviewed by the Supreme Court when carried there by the proper procedure.

As matters now stand, no patent case can be carried to the Supreme Court of the United States except by a writ of certiorari. As a result, few patent cases are determined by this tribunal. Under the act creating the circuit courts of appeals, each circuit, comprising two or more states of the United States, has its own court of appeals. There are nine circuits embracing all the states and territories of the United States, making nine circuit courts of appeals. By this plan a patent may be declared valid by the circuit court of appeals of the first circuit and held invalid by the circuit court of appeals of the third circuit. In other words, in some states of the United States the patent would be good and in others it would be worthless Thus, after prolonged litigation and much expense, a patentee would find himself bankrupt with no final decision determinining the validity of his patent. By having a single patent court of appeals, to hear and adjudicate all patent cases arising throughout the United States, the second decision of a court on the patent would finally determine its validity. For instance, suppose a case were filed in one of the Massachusetts federal courts and the patent declared infringed. The party would instantly appeal to the patent appeals court located at Washington, and its decision on the question of validity and infringement would finally determine the matter. Not only time would be saved by this course, as the delays under the present system would be avoided.

The American bar association has recommended and endorsed the bill filed by Mr. Beveridge, and while similar measures have been before Congress a number of years, it is believed that there is a good prospect of its passage. The only objection to it has been suggested by Congressmen who thought the establishment of a patent court of appeals might lead to the creation of a court of appeals for copyright cases, a court of appeals for railroad cases, and so on, *ad infinitum*; but the importance, great number and intricate character of patent suits would seem to make it imperative that this objection should not outweigh the necessities of the situation.

Explosives as Motors.

In a recent number of Science, a novel suggestion for the propulsion of air ships is made by Prof. Carl Barus, of Brown University. He points out that it has been proved that a machine of the aeroplane type built entirely of metal and canvas may be made to fly by the power of an ordinary steam engine judiciously constructed; and much better results may be expected from the gas engine. But the question arises whether these experiments actually meet the real issue involved. They prove that the power available in case of the ordinary engine is just about sufficient to maintain flight and no more; whereas a really practical machine should be provided with a motor whose output of work could be made to enormously exceed the demands made upon it, under conditions of smooth soaring.

If one is in search of a maximum of power combined with a minimum of weight, Professor Barus says, one involuntarily turns to some form of modern explosive, and in particular to those which can be worked up into wicks or ribbons. These could be adapted for use in connection with the rocket principle which has so frequently stimulated the imagination of inventors, in a way to require the least amount of subsidiary mechanism. In fact, such expansion is virtually its own propellor. The only question is, how can this quite prohibitively excessive power be controlled. In other words, how may the enormous expenditure of energy per second be reduced at will, and compatibly with safety and the need of the operator. Professor Barus suggests that in case of the nitrogen explosives, there may be a method of obtaining a continuity of power values within safe limits, from insignificant amounts up to the highest admissible, by using some appropriate method of very cold storage. It is well known that at sufficiently low temperatures phosphorus and oxygen cease to react on each other, that fluorine is indifferent to hydrogen, etc. It may be possible that an explosive tendency will be toned down as temperature decreases. If, then, there could be a gradation of power values by the cold storage of explosives, the problem of propulsion through the air might be solved. Such a motor would yield per pound weight not only all the power needed in the flying machine under any emergency, but large amounts of the source of such power could be taken aboard for use en route. The lower temperature of the upper air would here itself be an assistance. The suggestion is strikingly novel, but not more so than the gyroscope railway, and it is to be hoped that it will be given a trial.

Noise in Subways.

Investigations are being made to decrease the noise made by trains in subways. The reflection of the sound waves from the walls causes a deafening roar, unpleasant alike to travelers and to those in the vicinity. One chief cause of the noise is the friction of the wheels on the rails, especially on curves. A remedy for this has been found in replacing vehicles on fixed trucks by long cars on bogie trucks. Mufflers are also to be installed on rails and wheels, which are the principal sources of vibration. The shaking of the earth itself is to be deadened by the use of asphalt instead of concrete foundations, and the walls of the tunnels are likewise to be coated with asphalt, which has the property of absorbing sound. It is also suggested that the wheels should be made of disks, separated by some deadening substance such as wood, papier-mache or rubber.

Future Supplies of Energy.

A recent issue of *Cassier's* Magazine contains an interesting article by A. H. Gibson, upon the energy problem of the universe, considering the present known sources and the possibilities of the future. Leaving apart the fascinating field opened by radium (as being outside the scope even of prophecy) the energy of the universe is roughly classified under four heads: 1. Energy proceeding from the sun, which includes that of the winds and of waterfalls, since the last is available only in virtue of reevaporation of water that has reached the sea. 2. Heat energy already stored in the earth, and available because of the high temperature of its interior. 3. The kinetic energy possessed by the earth in virtue of its rotation, of which advantage may be taken by utilizing the tides. 4. Energy which may be liberated when chemical combinations take place.

Although the sun is the chief source of energy, and to it must be attributed all the energy stored in the coal fields and petroleum deposits, the direct utilization of this power is difficult. It has been attempted in California, where, by using huge parabolic reflectors driven by clockwork so as to have their axes always pointing towards the sun, and each carrying a steam boiler at its focus, by which water is pumped into an elevated reservoir, power has been obtained. But plants such as this can be established only in southern climates where there is very little rainfall. The force of the winds cannot be regularly relied upon, and the difficulties in storing energy so irregularly produced militate against the utilization of this power on any large scale. On the other hand, waterfalls afford a source that is steady, and does not involve great expense; this will before long, the writer thinks, become the second most important source of the world's energy, and the next fifty years may see the harnessing of every cataract of any size, to transmit power to industries far and near. This will mean the increasing development of the turbine as a prime mover.

As for the energy stored in the earth, its direct utilization is impracticable because of the great depth it would be necessary to bore in order to make it available—except in the neighborhood of volcanoes, which places are not exactly advisable for the establishment of centers of industry. The employment of the tides, due to the earth's rotation, is more feasible. Large masses of water can be caught in reservoirs at high tide, and allowed to escape through turbines as the tide ebbs. In a scheme to be developed on the coast of France near the estuary of the Seine, where the range of the tides is between 10 and 16 feet, duplicate basins are provided, divided by a bank in which the turbines are placed. The upper basin communicates with the sea during the highest part of the tidal range, and the lower basin during the lowest part, and available horsepower of from 3,400 to 8,800 is obtained at a low cost. This method is therefore most promising for the future, giving an almost inexhaustible supply of energy with absolute constancy.

Coming to the fourth and most generally used source of energy, that of chemical combination, it is known that the most valuable factors of this supply, coal and petroleum, will be exhausted within the next few generations. Since coal is at present, however, the most efficient source for motive powers, it is worth considering how its energy is likely to be most generally utilized in future. The steam turbine is believed to be the ideal form of prime mover for the use of steam, but unfortunately, it suffers from the disadvantage common to all steam engines, that of waste of fuel. Much of this loss is prevented in the internal combustion engine, and the balance of advantage is such as to lead us to expect that the prime mover of the near future will be the internal combustion motor, (whether using petrol, alcohol or gas) and will be a machine of the turbine type. With the exhaustion of coal will come an increased use of streams as sources of energy, and in suitable localities, of the power of the tides and the radiant force of the sun. With the improvement of high tension transmission of electricity for long distances, the future may see a series of stations stretching along the sides of the Mediterranean, and of the Gulf of Mexico, supplying power to centers of industry in the Southern States and Southern Europe. It is predicted that there will be in the course of time a general movement of the industrial center of gravity of the earth's population to a point where climatic conditions make the direct heat of the sun available for power purposes. One fact is certain, that in the future the engineer, using the term in its widest sense, will become increasingly essential to the social progress of the universe, and that on his labors and inventiveness, more than on that of any other class of society, will depend the ultimate physical well-being of mankind.

New Motor Boat.

A Frenchman has invented a motor boat which, instead of being driven, is sucked through the water. The propeller is placed at the bow of the boat, and consists of a number of blades symmetrically distributed around an axis and terminating in a cylindrical tube. Each blade is composed of two sheets or surfaces. One of these sheets is of a spiral-cylindrical shape, resembling a sheet of paper loosely rolled, with its inner edge at the axis and its outer portion forming part of the enveloping tube. The other sheet is smaller, inclined and helicoidal, like the blade of an ordinary screw-propeller. It extends from the front edge of the cylindrical sheet to a spiral line traced some distance behind the front of the cylindrical sheet of the preceeding blade. The front edges of the two sheets of each blade are riveted together and form a salient cutting edge, which slopes backward from the apex to the circumference at an angle of 45 degrees to the axis. As this new form of propeller has no projecting edges, it has advantages over the ordinary screw propeller in shallow water, and in places where there are vegetable growths. The inventor claims that he can attain great speed with this new method of propulsion, 60 miles an hour being within the limits of possibility.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings upon receipt of 10 cents per copy; twenty copies $1.50.—Please give correct data in ordering.—Address,

THE INVENTIVE AGE PUBLISHING CO., 918 F St., N. W., Washington, D. C.

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Animal-trap....H. J. Houtsinger
Annunciator. Time-limit....A. Saunders
Anthraquinone derivative....P. Thomaschewski
Antisiphon-trap....A. L. Bower
Aqueous solutions. Clarifying...J. A. Maignen
Arch or center. Collapsible..C. W. McDonald
Automatic brake....J. Lynch
Automobile frame member....M. W. Gartshore
Automobile-frames. Shaped iron or steel for....E. C. F. Verschave
Automobile-top bows. Holder for....S. D. Hunter
Automobile-train....A. De Luigi et al
Automobiles and like purposes. Reversible sign for....W. Schumacher
Axle. Car-....G. F. Price
Bag machines. Cutting apparatus for filled-....C. McNeil et al
Bag seaming, cutting, and conveying apparatus, 2 pats....C. McNeil et al
Bag seaming, cutting, and delivering apparatus....C. McNeil et al
Baker's peel....F. Nelson et al
Bale-tying attachment....J. Christensen
Baling-machine....W. S. Bryan
Baling-press....G. E. Jackson
Band-cutter and feeder....A. Mahlen
Bark from trees. Device for cutting....W. T. Tinsley
Basin-trap....A. M. Morrison
Basket-holder....G. S. Paine
Bearing. Adjustable....N. J. Theede
Bed....C. E. Kilbourne
Bed-canopy....L. E. Osborne
Bed-rest....N. P. Ellicott
Beet-blocker....L. F. Haynes
Beet-handling apparatus....D. L. Joehnck
Beet-puller....E. A. Smith
Bell....H. Koch
Belt....J. Askins
Belt. Conveyer-....H. C. Norton
Belt. Drive-....A. H. Gits
Blade-fastening....M. Rotter
Blade-fastening, 6 pats....N. C. Bassett
Block-signal apparatus....A. Bevan
Block-signal. Automatic electric....W. A. D. Short
Bobbin-slotting machine....D. S. Courtney
Boiler-setting....F. D. Warren
Boilers. Water-eliminator for steam-..J. Long
Bolster. Sham roll-....J. David
Bolster. Spring-....F. Helmick et al
Bolt and nut lock....G. W. Ketteringham
Book-mark....L. B. Chadwick
Boot and shoe polishing machine....M. Schuppe
Boots and shoes. Instep-supporter for....A. G. Gefvert
Bottle. Non-refillable....C. M. Conradson
Bottle. Nursing-....T. H. Cook
Bottle-scrubbing machine....W. Seidel
Bottle-stopper....E. M. Willis
Bottle-washing machine....G. W. Goehns
Bottles and the like. Carrying and setting-up machine for....H. J. Stiebel
Bow-rest....W. J. Decker
Box....C. C. Mengel
Box-setting-up machine....J. E. Erickson
Braiding-machine....A. Le Blanc
Brake and steering-knuckle. Combined....J. E. Landry
Brake-shoe....C. J. Egler
Branding or marking composition....J. Hauser
Brick, &c., and making same. Composition for....L. Houze
Brooder....L. C. Ellis
Brush....A. Schnurmacher
Brush. Fountain....R. L. Short
Brush. Fountain marking and stencil....E. A. and C. A. Garvey
Buckle. Trace-....G. E. Williamson
Buffer and coupling. Central....G. Johnston
Building-construction clamp....H. E. White
Building constructions. Clamping device for....C. H. Scammell
Bulletin-board....T. M. Shank
Buoy....T. L. Willson
Burglar-alarm....U. Magni
Butter-fat. Extracting or obtaining....H. D. Cooke
Camphor from camphene, isoborneol, or other camphor-producing substances. Producing....C. Glaser
Can-capping machine....G. G. Glass
Can-cover clip....G. Ackermann
Can-marking machine....I. S. Merrell
Candy-dipping machine....A. Kunitz
Canoe-carriage....J. J. Ravaillier
Car-coupling....P. J. Dugan
Car-door....J. L. Scverns et al
Car-fender....G. A. Parmenter
Car fender. Street-....M. Lund
Car-underframe....R. E. Frame
Car-unloading device....C. H. Smith
Car-ventilating device....G. W. Ruggles
Car-vestibule diaphragm....F. C. Arey
Carbid-feeding device....N. D. Shaffer
Carbon tetrachlorid. Refining....C. E. Acker
Carnations. Festening device for split....A. J. Baur
Cash-register....W. R. Heinitz
Cash-register....E. J. Hall
Casting. Producing an alloy for use in steel-....M. Meslans
Cash-register....W. Murphy
Centering and measuring instrument....A. Frank
Chain. Conveyer-, 2 pats....J. Dierdorff et al
Chairs. Ball-bearing for....I. E. Bedell
Chimney....C. Weber
China-kiln....J. C. Hinz
Chuck....J. H. Westcott
Chuck. Quick-acting brace-....M. A. Beard
Chute and controlling mechanism therefor for elevators, bins, and the like....R. A. Ogle
Chute feeder. Coal-....A. C. Miley
Cigar-bunch structures. Producing....O. Hammerstein
Cipher. Apparatus for correspondence in....C. Haas et al
Clamp....B. H. Meese
Clamping device....E. F. Glock
Clasp....C. E. Peterson
Claw. Artificial....W. Grabowsky
Cleaning implement....P. R. Cottrell
Clock. Electric....U. L. Collins
Clutch. Fluid-controlled....J. G. Leyner
Coal-tar pitch. Producing....J. F. Lovejoy
Coffee-mill....F. Bartz et al
Coffee-mill receptacle....F. Bartz et al
Coin-containing box....F. Stiebel
Coke-oven....A. O. Jones
Coke-oven and similar devices. Closure for....H. Koppers
Coke-oven-charging machine....A. Ernst
Collapsible box....H. T. Brown
Compound engine....D. Parrett
Compressor. Rotary blade-....C. Kohler
Computing-meter....W. E. Boyce
Concrete building construction. Reinforcing-frame for....M. L. Cooper
Concrete. Manufacture of bituminous....J. L. Rake et al
Control system....H. D. James
Control system. Multiple-voltage..H. D. James
Conveying apparatus....T. S. Miller
Cooking or culinary utensil....L. J. Ellis
Cooking vessels. Audible alarm for electric....J. I. Ayer
Copper and other metals from roasted pyrites. Extraction of....A. Tixier et al
Copper-refining apparatus....F. L. Antisell
Copy-holder....J. Gramelspacher
Core and casting....R. Milne
Core-box-filling apparatus....E. E. Witham
Core. Collapsible....G. F. McKee et al
Cork-puller....H. Clark
Corn-popper....G. B. and J. H. Young
Cot or divan. Folding....B. McIntosh
Counting-machine....J. M. Johnson
Counting mechanism....H. Aron
Cranes. Clutch arrangement for traveling....A. H. McDougall
Crate. Banana-....C. Howe et al
Crate. Knockdown....J. F. Schoeppl
Crate structure....E. F. Hulbert
Cribs. Clothes-fastener for....W. F. Lazaro
Cuff-holder clasp....S. G. Smith
Cultivator-shovel....P. Priess
Cultivator. Wheeled....S. D. Poole et al
Cultivators. Spring-trip for...L. Reeves et al
Curb-protector....S. Whinery
Current motor. Alternating-....D. C. Jackson
Curtain-fixture....G. A. Miller
Curtain-stretcher....M. W. Hearn
Curtain-stretcher....H. A. Schwarz
Cut-off. Automatic....F. Hoelder et al
Cutlery-glazing machine....J. G. Blessing
Cutting-machine....C. von Philp
Cutting-tool....J. W. Eckley
Desiccating apparatus....M. W. Barse
Desks. Folding joint for school-....J. F. Field
Detinning and producing tin compounds and other products....E. A. Sperry
Directory. Telephone-....A. Weinraub
Disinfecting, antiseptic, and other purposes. Composition for....L. H. Reuter
Distillation. Apparatus for wood....G. B. Frankforter
Door-fastener....M. J. Flannery
Door-holder....T. C. Scheld
Door-mat....E. W. Cruikshank
Door. Warehouse-....J. G. Wilson
Draw-bar hook. Auxiliary....B. Burgess
Dredge-pipe. Rifle....G. Dickson et al
Drying apparatus....G. W. McMullen
Dumping-bucket....J. Hamilton
Dye. Greenish-black azo....W. König
Dye. Violet-black azo....W. König
Dyeing apparatus....F. N. Patterson
Easel....W. D. Smith
Egg-opener....F. Fleischmann
Elastic webbing....S. Kops
Electric cables. Carriage for conveying drums of....W. A. Turner
Electric controller....J. Ledwinka
Electric heater....A. Voelker
Electric-light hanger. Adjustable..J. McGavin
Electric machine. Hydro-....H. E. Fry
Electric motor....D. C. Jackson
Electric regulation....M. Moskowitz
Electric switch....J. J. Wood
Electric time-switch....J. C. Van Slyke
Electrolytic receiver....F. C. Pickett
Elevator-boot....C. Bradford
Embroidery machine. Scalloping-....W. N. Parkes
Emulsion of oil and the like....O. A. H. H. Kösters
Engine construction. Traction-..W. H. Colean
Engine exhaust-control mechanism. Gas-....E. C. Maddox
Engine regulating device. Internal-combustion-....O. Podhajsky
Engine sparking mechanism. Explosion-....L. A. Gianoli
Engines. Dust-protector for traction-....S. Hughes
Engines. Induction-coil and box for explosion-....R. Varley
Engines. Magneto igniting device for explosive-....H. de La Valette
Eraser-cleaning apparatus. Blackboard-....S. M. Case

Excavator....C. A. Frayer
Exercise-bat....C. E. Kimble
Eyeglass nose-guard....L. F. Adt
Farm-gate....W. A. Crawford
Feed-bag....H. E. Locke et al
Feeding apparatus. Stock-....E. McGlinchay
Fence-machine....R. Kirkwood et al
Fence-post....C. S. Beebe
Fence-wire tightener....H. Broome et al
Fencing-machine....W. B. Sorrells
Ferrovanadium. Producing....E. F. Price
Fertilizer-distributer....O. T. Little
Fertilizer-distributer....J. R. Ayers
Fiber strands. Machine for making....W. R. Green
Filing device. Credit-account-....W. Eacrett
Filter medium....E. M. Knight
Finish-remover....C. Ellis
Fire-box door....W. D. Westbrook
Fire-escape....R. Watson et al
Fire-extinguisher system. Bucket-and-tank....A. C. Rowe
Firearm. Automatic....C. L. H. Prinke
Fireproof stair structure....E. E. Schachner
Flooring....F. Burchartz
Flowers, &c. Portable stand for...J. F. Bastel
Fluid-pressure system....W. J. Richards. (Reissue.)
Flush-tank....W. L. Reed
Foldable box....J. E. Turton, Jr., et al
Folding table and receptacle. Combined....J. E. Loftin
Forging in dies. Apparatus for....E. Lelong
Formaldehyde. Gene rating....A. Eichengrün
Formates. Making....C. Ellis et al
Fuel-feeding device....J. W. Ormsby
Gage....M. D. Brown
Game apparatus....H. C. Loudon
Game-board....T. H. Youngman
Garment-supporter clasp....J. Maltby et al
Garter-clasp....W. C. Finney
Gas-burner....E. Ruud
Gas burner. Acetylene and like..K. Thurnauer
Gas-engine....J. B. Hoover
Gas-generator....W. Kirkwood
Gas generator. Acetylene-....T. F. Little
Gas generator. Acetylene-...F. E. Stover et al
Gas-generators. Means for automatically regulating the supply of oil to....H. C. Hanson
Gas-lighter....C. C. Hartley
Gas-meter....J. R. Armstrong
Gas-regulator. Automatic....D. H. Kent
Gasolene-engine....G. W. Stanley
Gate....J. H. Wilson
Gear. Variable-speed and reversing....J. Worthington
Gearing. Power-transmission....V. D. Munger
Glass caskets, hath-tubs, or similar articles. Mold for....J. Bonshire et al
Goods-handler....J. C. Hoover
Grain-conveyer....E. J. Vraalstad
Grain-treating apparatus....C. P. Thompson
Granular furnace....H. N. Potter
Grasshopper-destroying machine...B. Francisco
Grate-fender....M. J. Adams
Grinding-mill and pulverizer....J. W. Boileau
Gun. Gas-....W. S. Franklin
Gun hand-protector....P. North
Gun-sight. Removable....J. B. Uren et al
Gynecological sling....M. C. Burrus
Gyroscope....N. Ach
Hair-clipping device....I. N. Brigham
Hand-bag....G. T. Willis
Harness....R. T. Cummings
Harrow....J. W. Wandell
Harvester attachment. Bean-....G. E. Lewis
Harvester. Pea-....J. F. Wheeler
Hat and coat rest....A. J. Le Messurier
Heater....C. T. Bride
Heating and ventilating system..E. W. Woods
Heating apparatus. Hot-water....A. B. Reck
Heating apparatus. Steam and water....E. S. Manny
Heating-furnace. Continuous, 2 pats....J. Reuleaux
Heating system....S. V. Sharood
Heating system....A. McGonagle
Heddle-manufacturing machine....W. Fehr
Heel-attaching machines. Top-lift or heel holder for....J. W. Baddock
Hides and skins. Bating....O. Röhm
Hinge....W. R. Corbin
Hoisting apparatus. Pivotal head for....W. H. Arnold
Hoisting-engine. Compound-geared friction....J. P. Karr et al
Hollow ware. Producing enamel-lined articles of....E. B. and C. R. Manning
Honey-extractor....C. G. Luft
Hook and eye....C. H. Gaskins et al
Horse's foot and leg bath..H. R. O'Brian et al
Horseshoe....M. Gates
Hose-clamp....H. A. Wahlert
Hose-supporter clasp....H. Binney
Ice-elevator. Automatic....W. H. Lynch
Impact-wheels. Bucket for....W. H. Doble
Incandescent mantle....G. J. Seckel
Incubator....G. L. Scott
Ink-well....H. G. Campbell
Inking apparatus....R. T. Johnston
Insect-cremator....S. F. Snyder
Insulated rail-joint....A. Morrison
Internal-combustion engine....G. J. Altham
Jewelry-clasp....G. Godley
Journal-box lid....C. D. Whiting
Junction or connecting box....J. A. McCoy
Knife-cleaner....J. Brown
Knife-setting gage....C. H. West
Knockdown box....A. N. Miller
Lace and fastener. Shoe-....P. M. Chartres
Lace hook. Shoe-....O. H. Eliel
Lamp filaments. Machine and apparatus for manufacturing electric-incandescent-....F. M. F. Cazin
Lamp fixture. Incandescent-....J. Stubbers
Lamp for burning carbureted air..F. W. Suter
Lamp. Incandescent electric....C. L. R. E. Menges
Lamp-socket....W. R. Lambert
Last....W. E. Trufant
Lawn-shears....F. C. Brown
Leather-dressing. Liquid....G. W. Childs
Leather-skiving machines. Feed-roll for....A. Hirth
Legging....M. Rosenwasser
Letter-sheet....C. M. Tubbs
Level and gage. Combined spirit-....T. D. Rowan
Level and square....C. J. Cramer
Levers. Adjusting-gage for....E. C. Mershon
Limb. Artificial....W. G. Wyatt
Liquid-feeding device....J. F. Smith
Loader. Shock-....J. W. Laverence
Loader. Shock and hay....F. Forman
Loading device. Conveyer....J. L. Wilson
Loading-machine....T. N. Carter
Loading machine. Earth-....A. Meierhoff et al
Lock....A. Schmidtke
Lock and latch....N. B. Hurd
Locking device....J. P. Geraghty
Locomotive-cinder-collecting attachment....J. Speier
Log-skidding machine....J. R. McGiffert
Loom stop-motion....F. Pick
Loom thread-parting mechanism...A. E. Rhoades
Lubricated coupling....R. A. McKee
Lubricator....W. N. Durant
Magnet. Field-....W. D. Pomeroy
Mail-box....C. M. Hartwell
Mail-cabinet....C. W. Moore
Marking-pin....W. W. Morrell
Mask. Catcher's....A. C. Ferry
Measurer. Distance and angle....J. M. Kauffmann
Measuring and drafting device. Garment....M. C. Pelton
Measuring device....D. E. Conlon
Measuring device....A. E. Thomson
Measuring device. Liquid-....H. V. Johnson
Measuring device. Rotary....M. H. Richardson
Mechanical movement....G. Brenner
Mechanical movement....M. John
Medicine-case....J. Bristow, Jr.
Metal-drawing machine....G. W. Frohlich
Metal. Expanded, 2 pats....N. E. Clark
Metal-working machine....N. E. Clark
Meters. Switch for electric....J. J. Wood
Military equipment....A. J. Davey
Milk-handling can....W. Seidel
Milking-machine....A. H. Loqvist
Mills. Resilient connection for pendulum-....H. Behr
Mine-roof support....F. C. Keighley
Mining-machine....H. Specht
Mixing apparatus....C. Mastain et al
Mixing-machine....M. H. Avram
Moistener....M. A. Metzner
Mop-head....H. M. Sturgeon
Motor control. Electric-....H. D. James
Motor control. Multiple-voltage system of....W. H. Powell
Motor control. Multivoltage system of electric-....H. D. James
Motor-control system. Electric-...H. D. James
Motors. Exhaust-silencer for gas-....A. Weber
Mowers. Grass-catcher for lawn-..D. Fergesen
Mowing-machine....M. Jewell
Music-stands and the like. Sheet-holder for....C. H. French
Musical instrument. Self-playing....L. B. Doman
Musical instruments. Take-up roll for automatic....M. Clark
Nail-driving tool....S. F. Dutton
Necktie....C. W. T. Davis
Needle-threading machine....H. E. Noon
Nut and screw-bolt lock....A. D. Gaston
Nut-lock....H. J. Berkley
Nut-lock....D. Verna
Oil-can....F. D. Borland
Oil-engine....O. Gassett
Ophthalmometer....E. B. Meyrowitz
Optical tool....G. E. Schofield
Ore desulfurizing and agglomerating furnace..A. J. Dull et al
Ores and matter. Extracting metallic....E. Günther et al
Ores and the subsequent separation of the liquids from the solids. Apparatus for leaching....J. H. Gillies
Ores by the precipitation process. Metallurgical treatment of sulfurous....A. H. Imbert
Ores containing zinc and other volatilizable metals. Treating complex....G. M. Rice
Ores. Desulfurizing and agglomerating comminuted....A. J. Dull et al
Oven. Collapsible warming-....W. E. Sloan
Overseaming-machines. Presser-foot for....R. G. Woodward
Overshoe-retainer....R. F. Fraizer
Package-fastener....P. R. Le Boeuf
Packing. Piston-rod....R. E. L. Martin
Packing. Pump piston-....J. J. McGee
Packing. Rod-....O. J. Garlock
Packing. Shaft-....F. Samuelson
Paint-removers. Applying....C. Ellis
Paper bag....C. Underwood
Paper-bag-making apparatus....O. Hesser
Paper box....G. W. Swift, Jr.
Paper-coating machine....M. Cantine
Paper-cutter....C. L. Smith
Paper-feeding mechanism....H. B. Cooley
Paper-making machine....C. Eichhorn et al
Paper-making machines. Calender-feed for rolls of....R. Smith
Paper manufacture, 2 pats....W. R. Green
Paper-pulp from straw. Making...L. K. Böhm
Paper-sheet-handling machines. Automatic stop mechanism for....B. Gustafson
Patterns. Tailor's templet for making....J. F. Schoeppl
Pegging-machine....J. A. Caron
Pen and pencil holder....G. B. Graves
Penholder-guiding attachment....B. H. Collins
Pencil-sharpener....W. F. Herdrich
Phonograph....E. L. Aiken
Picture-exhibiting machine....B. B. Cole
Picture film. Moving-....F. L. Dyer et al
Picture-holder....H. Meltzer et al
Pipe-coupling. Detachable....A. L. Shears
Pipe-hanger....I. G. Lane
Pipe, tube, and tubular structure....W. H. Wilkening
Pipes. Automatic regulator for steam-....F. W. Gove
Plow....W. Taylor
Plow attachment....J. Bingaman
Plows. Adjustable scraper attachment for disk....J. P. Fell
Pneumatic motor and speed-governor....T. Danquard. (Reissue.)
Pole and like erecting machine....J. H. Green
Pool bowling-table....T. A. Upton
Portable furnace....G. E. Ruhmann
Potato-masher....D. E. Johnston
Powder-box....C. Bokay
Printing apparatus. Ticket-....J. A. Walton
Presses. Vibrating distributing-roller for platen-....J. H. Schussler
Printing leaves for books. Machine for....G. A. Walstead et al
Printing machine. Ticket-....W. C. Reynolds
Printing mechanism for adding-machines....W. F. Gatewood
Printing-press....G. W. Prouty
Printing-press gage attachment....J. T. Gay
Projectile....C. V. Wheeler et al
Propeller....A. A. Anderson
Pulley. Friction-clutch....L. H. Geisendorff
Pump. Air-....B. Hamann
Pump for vacuum-cleaners....A. Mestitz
Pump. Oil-....W. A. Odell
Pump-rod connection....W. E. Boyd
Puzzle novelty....L. J. Monahan
Rail and tie coupling....P. A. Ilson
Rail-bond. Electric....F. M. Marcy
Rail-fastener....S. G. Petterson
Rail. Guard-....A. Morrison
Rail-joint....J. L. Fenn, Jr.
Rail-joint....J. O. Wrench
Railway and other vehicles. Brake for....A. J. Reid
Railway and other vehicles. Coupling for controlling rods of brakes between....A. J. Reid
Railway construction....C. R. Bowen
Railway-motors. Ventilation of electric....G. Gibbs
Railway-signal....P. H. Slaughter
Railway-switch....F. J. Reilly
Railway-switch frog....J. E. Graham
Railway-tie....E. T. Forrester
Railway-tie....C. S. Smallwood
Railway-tie and fastener. Metallic..J. G. Smith
Railway train-stop. Electric-....E. Woltmann
Railway-vehicles. Automatic coupling for....W. Thorn et al
Razor-blade protector. Safety-....F. B. King
Razor. Safety-....J. J. Steinharter
Razor. Safety-....P. K. Stern
Receptacle-closure. Safety....L. A. Wilson
Refrigerator-building....F. B. Clayton et al
Refuse-receptacle....E. E. Irish
River-banks. Means for protecting....C. M. Westenhaver
River-beds and waterways. Means for causing an automatic scouring action for the removal of silt from....L. J. Audouin
Riveted joint....A. Hertwig
Roasting-pan....P. Scott
Roll-housing....R. Moon
Rolling tie-plates....A. Morrison
Roofing. Composite....G. F. Bishopric
Roofing. Flexible....F. C. Overbury
Roofing-strip....F. C. Overbury
Rope-clamp....L. D. Shryock
Rotary engine....M. Frauenthal
Rotary trimmer....A. C. Bowser
Rotating motor with rectilinear cylinders....A. Bagnulo
Rubber compound and material for use in making same....E. W. Strain
Rubber sandal....A. O. Bourn
Ruffling-machines. Tripper-blade support and guide for....R. G. Woodward
Ruling-machine crimping attachment....A. Peterson
Safety-pin....H. Kaspar et al
Salt-shaker....O. Kampfe
Sash-balance....F. Harbach
Sash clamp. Window-....J. S. Wallace
Sash-fastener....A. H. Hansen
Sash hanger or separable hinge. Storm-....F. Bursik
Sash-lock....L. Foery
Sash-lock. Duplex....W. Lipps
Saw-set....P. J. Leavens
Scale. Automatic grain-....T. J. Young
Scarf-pin-securing device....A. and B. Rainess
Scoop-handle....H. D. Clark
Scraper. Culinary....W. A. Johnston
Screen or grating....M. Levy
Screw-clamp....A. N. Verdin
Seal-lock....H. B. Mackintosh
Sealing cap. Receptacle-....W. E. Heath
Seaming machine. Butt-....C. L. Turner
Secondary or storage battery..H. Rodman et al
Self-lubricating wheel....W. C. Fownes et al
Sewed articles. Seam for....L. Onderdonk
Sewer-mold. Sectional....G. Georgenson
Sewing-machine....W. N. Parkes
Sewing-machine. Automatic embroidery or ornamental stitch....W. N. Parkes
Sewing-machine. Blindstitch....W. N. Parkes
Sewing-machine bobbin-case-threading mechanism....W. N. Parkes
Sewing-machine bobbin-controller. Automatic..W. N. Parkes
Sewing-machine bobbin-controlling mechanism..W. N. Parkes
Sewing machine. Buttonhole-, 2 pats....W. N. Parkes
Sewing machine. Chain-stitch....L. Onderdonk
Sewing-machine cover and chair. Combined...J. Twinem
Sewing-machine. Embroidery or ornamental stitch, 2 pats....W. N. Parkes
Sewing-machine feeding mechanism, 2 pats....W. N. Parkes
Sewing machine. Filled-bag-....J. Bigelow
Sewing machine. Filled bag-....C. H. Foster
Sewing-machine folding guide...W. E. Barnes
Sewing machine. Glove-tip-....C. R. Morley
Sewing-machine guide and presser-foot....J. Hudson
Sewing-machine. Hemstitch....W. N. Parkes
Sewing-machine looper mechanism, 2 pats....W. N. Parkes
Sewing-machine looper mechanisms. Lubricator for....W. N. Parkes
Sewing-machine looper movement....W. N. Parkes
Sewing-machine looper-operating mechanism, 2 pats....L. Onderdonk
Sewing-machine needle-actuating mechanism...W. N. Parkes
Sewing-machine needle-adjusting device....W. N. Parkes
Sewing-machine. Ornamental-stitch, 3 pats...W. N. Parkes
Sewing-machine ruffler attachment....A. G. Lamb
Sewing-machine stop mechanism..W. N. Parkes
Sewing-machine take-up and needle-bar mechanism....W. N. Parkes
Sewing-machine thread-controlling mechanism, 2 pats....W. N. Parkes
Sewing-machine thread-cutter [illegible]
Sewing-machine tucking [illegible]
Sewing-machine work-clamp [illegible]
Sewing-machines. Apparatus [illegible] filled bag- [illegible]
Shackle for tra[illegible]
Shade fixture. [illegible]
Shade. Win[illegible]
Sharpener. [illegible]
Sheet-metal [illegible]
Ships. Automatic [illegible]
Shocker....
Shoe-protector....
Shovel A-frame and [illegible]
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Signaling device. Safety [illegible]
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Signature-gatherer....C. E. [illegible]
Silicon carbid. Making....H. N. Potter
Silicon dioxid. Making....H. N. Potter
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Skate. Roller-....C. M. [illegible] al
Sled....L. D. [illegible]
Sled-runner attachment....W. J. La [illegible]
Slicer. Fruit and vegetable....J. E. Walston
Small-arms. Automatic safety appliance for locking the hammer and the sear of....J. Tambour
Smelter smoke and extracting values from ores or metallurgical waste products. Treating...S. S. Sörensen et al
Smelting. Electric....F. Creelman
Smoking-pipe....R. J. McMurray
Soda-water glasses. Holder for....W. Livingstone
Solder to sheet metal. Applying molten....W. G. Daugherty
Soldering apparatus. Can-....C. W. Sleeper
Sound-records. Making....I. Kitsee
Spark and contact-spark device. Combined jump-....C. R. Greuter
Speed-regulator....C. Schmitthenner
Spinning-mule attachment....R. J. Harrington
Spinning-spindle and bearing therefor....C. H. Chapman
Spraying fruit-trees. Compound for....C. J. Herring
Spring-plank....R. E. Frame
Stamp. Time-....H. O. Jackson et al
Steam-boiler....F. J. Hickey
Steam-engine....A. Siabloff
Steering-gear....G. G. Porter
Stenciling designs on post-cards, &c. Apparatus for....A. G. Pirkis
Stitch machine. Ornamental-....W. N. Parkes
Stitch machine. Zigzag and ornamental....W. N. Parkes
Stitching machine. Eyelet or embroidery....W. N. Parkes
Stocking-drier....P. J. Timberlake
Stoker. Automatic....H. E. Wallis
Stone-crusher....G. R. Starnes
Stop. Automatic non-reversing....S. F. Evans
Stove base. Cook-....A. Darrow
Stoves. Electrical igniting device for gas-....V. C. de Ybarrondo
Stoves. Hot-water attachment for....M. P. Freebey et al
Stovepipe-fastener....G. O. Helvig
Street-indicator for cars....D. W. De Sylvia
Street-sweeper....F. E. Penfold
Stringed instrument with spring-hammers. Mechanical....P. Lochmann
Sulfur. Making chlorids of....C. E. Acker
Switch....C. N. Bergmann
Switch handle. Rotary-snap-....J. G. Peterson
Switch-operating apparatus....G. J. Beard
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Table-mat....H. M. Hinman
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Talking-machine recorder and reproducer. Combined....T. H. Macdonald
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Telephone-dictating system or apparatus....J. W. Kelly, Jr.
Telephone-transmitter....C. Umbach
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Time-recorder. Workman's, 2 pats....F. J. Tran
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Tire. Resilient....I. W. Hodgson
Tire-tightener....J. H. Cameron
Tire-tool....G. Mohme et al
Tire-valve-stem protector....C. W. Luttey
Tires. Implement for applying rubber....S. A. Oliva
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Toy telegraph pole, base and reel....W. R. Haberlin
Track-sander....J. M. Smith
Training device....V. Pilia et al
Transmission mechanism....S. C. Carter
Transom-lifter....T. Rolley
Transom-lifter....F. J. Chell
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Tray. Serving-....C. D. Mitchell
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.....J. B. Secor
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.....J. Huebsch
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.....E. Ruud
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Well-drilling tool.....F. S. Freeland
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.....J. B. Hadaway
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.....P. E. Breckheimer
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Badge or emblem.....E. R. Seppard
Cycle frame. Motor-.....P. Kelecom
Doily.....R. Gair
Finger-ring or similar article.....J. L. Herzog
Flask.....T. R. Harper
Gas-heater.....A. T. Wehrle
Glass. Sheet.....F. Woltjen
Glass vessel.....A. Buskey
Hinge-leaf.....W. J. Neidl
Lamps. Ceiling fixture for electric.....
.....J. H. Goehst
Percolator stand and lamp....E. A. Gutermann
Pin or button head.....D. P. Barry
Post-card.....J. Kramer
Range.....J. Becvar
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Abrading-wheel.....E. F. Landis
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.....O. Lange
Mail-bag-delivery apparatus for railways.....
.....T. Mackim
Mail-bags, &c., Means for fastening.....
.....V. Mazzatenta
Mail-box signal-lock.....S. Patterson et al
Mail-box signaling apparatus.....T. H. Sparks
Mail-delivery system.....J. F. Stout
Manicuring implement.....D. F. Asbury
Manuscript-holder.....R. S. Lafoon
Marker, Hill-.....P. Christiansson
Massage apparatus.....H. W. Smith
Match-box.....H. J. Breeze
Measuring device.....F. L. Racouillat et al
Measuring instrument.....I. E. Burley
Mechanical movement.....L. D. Green
Mechanical movement.....T. V. Buckwalter
Metal, &c., Machine for feeding sheets of.....
.....F. McIntyre
Metal structure.....E. A. Wilson
Milking apparatus, Pulsating device for.....
.....E. E. Good
Milking apparatus, Teat-cup for.....E. E. Good
Mirror, Hand.....H. Burrell
Miter-box.....A. D. Hughes
Miter-box.....O. Cassity
Mold.....P. T. C. Dumais
Mold.....J. Bertram
Mold.....W. J. Miller
Mold-ramming apparatus.....H. Henderson
Mortise-lock.....L. S. S. George
Motor control system, Electric-..A. C. Eastwood
Motor-controlling mechanism, 2 pats.....
.....H. W. Cheney
Motor speed-regulator, Spring-...P. J. Mueller
Motor-supporting device.....A. Insinger

Motors' Mechanism for preventing racing in prime....H. E. Warren
Mount....E. S. Cheney
Mower, Lawn....J. G. Barri
Music-holder....E. P. Dorward
Music-leaf turner....L. R. Stanton
Musical-instrument keyboard...J. C. Hofbauer
Musical instruments, Attachment for levers for automatic-playing....L. Blasius
Musical instruments, Means for opening and closing panels of....W. J. Keeley
Musical instruments, Note-sheet for automatic....I. B. Smith
Musical instruments, Rhythm-indicator for mechanical....P. Wuest, jr
Musical instruments, Tempo device for mechanical....J. O'Connor
Musical scales, Device for illustrating the transposition of....L. A. Jaros
Nailing-tool....M. Pearson
Necktie attachment....J. Grossgebauer
Needle-threader....C. A. Murphy
Net-casting apparatus....G. K. Cloud
Nut, Fast....W. H. Cook
Nut-lock....G. H. Orr
Oar-operating device....J. A. Musgrove, Jr
Oil-can....W. E. Dillard
Operating-table....J. H. Downey
Ores, Treating....J. Savelsberg
Packing, Rod-....C. W. G. King
Pan....M. A. Nash
Paper-bag-manufacturing machines, Gripping and folding device for....P. L. Bartholomew
Pattern-paper linen....B. Borzykowski
Pen cleaner, Drafting-....W. A. Steineman
Penholder....C. E. Walker
Pencil, Automatic magazine-....J. A. Newman et al
Pencil-box....E. I. Hawk
Percolator....C. E. Trewhella
Phonograph and other sound-producing machine....H. S. Mills
Photographic-film cartridge....H. L. Gray
Pier, Floating....C. E. Grant
Piling, Sheet-....J. T. Pyle
Pipe-drawing machine, Lap-weld..L. W. Noyes
Pipes, Flexible joint for dredger-..M. R. Peacock
Pistol, Electric....E. O. Pfeil
Planter....J. Farley
Planter, Check-row....C. C. Butcher
Planter, Corn-....P. Christiansson
Plow....F. S. Fuller
Polishing-wheel....J. B. Fontaine
Postal card....J. Walker
Potato-digger....J. Mold
Power-transmission mechanism....J. L. Nelson
Printer's furniture....W. S. Warnock
Printing-machinery throw-off mechanism....H. F. Bechman
Printing-press....C. B. Whitaker
Printing press, Automatic card-..W. A. Billman
Projectile....C. Rockhill
Propeller....O. O. Gilbert
Propulsion, Marine....A. E. Beebe
Protractor, square, &c., Transformable....A. L. Darr
Pulley-block....B. W. Hammond
Pulley, Friction clutch-....J. Gilson
Pulp-grinding apparatus, Wood-....K. Gevers
Pump....C. E. Pfender
Pump, Oil-well....W. Wallace
Pumps, Safety clutch for power-driving....W. H. Heard
Radiator-making machine....F. H. Stolp
Rail-joint....A. R. Rich
Rail-joint and nut-lock therefor....J. B. Baum
Railway-conductor's folder and car-record....A. Keiser
Railway cross-tie....D. R. L. Boyd
Railway-gate....J. R. Hinton
Railway-rail joint....J. M. Steele
Railway-spike....G. C. Clover
Railway-switch....S. L. Shellenberger
Railway-tie....A. F. Shuman
Railways, Safety-signal system for....W. F. Herting et al
Railways, Single-track signaling and train-controlling system for....F. E. Kinsman
Reach-bar....W. H. Rakestraw
Reclining-chair....W. White
Refrigerator-guard....J. F. Davis
Rein-guard....G. W. Born
Releasing device, Electrically-controlled....R. P. Barnes
Releasing device, Electrically-controlled....C. J. Kintner
Reversing-switch....A. C. Eastwood
Rivet-cutter and punch....C. H. Lau
Rock-drill....R. S. Trott
Roofing material, Method of and means for making, 2 pats....F. C. Overbury
Roofing-strip....F. C. Overbury
Rope-clamp....M. Blum et al
Rotary engine....R. H. Higginbotham
Rubber-holder....F. C. Reed
Sad-iron, Electric....W. J. Barr
Sap-collector....M. Hall
Sash, Convertible window-....H. J. Foltz
Sash-fastener....R. Fleming, Jr
Sash-fastener....C. H. Messick
Saw-guide, Drag-....S. S. Pearl
Saw-swage....C. A. Knowles
Sawing-machine, Band....E. T. Davies
Scaffold-bracket, Safety....J. R. Watt
Scaffolds, Track and carriage for swing-....R. Kersey
Scale....E. M. Wade
Scissors-gage....W. B. Kitterman
Scoops, Attachment for steam-shovel....J. W. Turner
Scoring device....M. F. Stanley
Seal, Self-locking....H. G. Bentley
Seeder, Tobacco-....B. Mylor et al
Self-registering lock....H. Lanham
Sewage liquefying and purifying apparatus, Portable....F. J. Commin
Sewing-machine gage....J. A. Flood
Sewing-machine stopping mechanism....H. C. Miller
Sewing-machine tucker and gatherer....P. T. Smith
Sewing-machines, Under-thread mechanism for....J. Vannette
Sexual armor....E. E. Perkins
Shaft-supporter....S. Tracy
Shaft, Vehicle....W. H. Rakestraw
Sheathing, Metallic....B. F. Savery
Sheathing, Metallic....L. J. Berg
Shells, Spreader for....H. E. Winans et al
Shield for enlarged joints....J. H. Schiffhauer
Ship....J. Reid
Ships, Device for retarding and stopping the motion of....E. P. A. Villette
Shock-absorber....L. Whitcomb
Shoe-ironer....S. J. Wentworth
Show-case....J. H. McKiernan et al
Shuttle....G. Pavia
Sifter, Flour-....J. E. Trice
Singeing-machine....W. W. Burson
Skate....G. Fletcher
Skate, Combined roller and ice....T. Spacie
Skate, Roller-....P. M. Rulli et al
Sled....T. Mouradick
Sleeve, Connecting branch....D. F. O'Brien
Smelting-furnace with oil fire....A. Koch
Snap-fastener....G. A. Holmes
Soap cake....A. F. Conery, Jr
Socket-key clamp....M. Loewenthal
Sound recorder and reproducer...M. Schwartz
Sound reproducing and modifying device....W. W. Young
Sparking device....B. G. Gilbough
Speed-indicator....C. R. Benton
Spoke-puller....G. L. Preston
Spool....P. Hardman
Spool-holder....B. Empfield
Spool-molding machine....W. Burke
Spring-compressing clamp....F. R. Wickwire
Spring-fork....M. Schenck
Spring-hook....G. Leighton
Stacker, Pneumatic....E. J. Vraalstad
Stamp-affixing machine....W. C. Van Vliet
Starch, Stabilized nitrated, 16 pats....F. B. Holmes
Steam, Apparatus for the rapid generation of....G. R. Steward
Stethoscope....D. O. Fosgate
Stone-cutting machine....J. R. Peirce
Stool and music-stand, Combination....J. J. Schurger, Jr., et al
Straw-press....H. N. Bingham
Stump-puller....E. A. Grundeen
Surfacing-machine....C. A. Edlund
Suspender cast-off, 2 pats....J. J. Buchanan
Switch....C. H. Holley
Table....E. P. Wanner
Tanks, Apparatus for automatically discharging ore-pulp and other material from....J. C. Winchell et al
Taper tap, Adjustable....M. Paulson
Tapping device, Beer-keg-....C. W. Pleukharp
Telegraph apparatus, Combination sending and receiving wireless-....A. L. New et al
Telegraph-transmitter....C. E. Lee et al
Telegraph transmitting system, Wireless-....L. De Forest
Telegraphy, Quadruplex or multiple....L. Connell, Jr
Telephone-switchboards, Designation-plug for....A. H. Adams
Testing-machine....T. Olsen
Thermometer attachment, Clinical-....R. F. Schneider
Thermostat....O. Saugstad
Thill-coupling....N. H. Mertes
Thread-cutting machine, Taper-..W. W. Vosper
Ticket, Railway and other....J. S. Alexander
Ticket, Railway fare receipt-..H. N. Brown et al
Tire....W. D. Harris
Tire, Vehicle-wheel....J. Jackson
Tobacco-spearing machine....A. Hovey
Tongue, Jointed....T. Ottason
Tool, Combination-....E. E. Mullinix
Tool, Percussively-driven....D. L. Mason
Tooth-crown....T. A. Davis
Tooth straightener, Cylinder and concave....C. G. Wernicke
Torpedo-placer....P. Peter
Traction-engine....R. Russell
Truck....A. M. Teal
Truck, Electrically-operated baggage-....T. V. Buckwalter
Trunk....W. H. A. Stout
Tubing, Machine for making flexible..C. O. Berg
Turbine....B. Heymann
Turbine bucket-wheel....J. Wilkinson
Turbine, Reversible....H. M. Murphy
Type-writer frame....G. A. Smith
Type-writer ribbon mechanism...F. X. Wagner
Type-writing machine....J. H. Birch et al
Valve-disk....A. W. Cadman
Valve for fluid-pressure brakes..W. H. Sauvage
Valve mechanism for internal-combustion engines, Inlet-....H. Reinshagen
Valve, Quick-opening....J. T. Hayden
Valve, Regulating-....A. Ullmann
Varnish or paint, Substance for removing....W. H. Allen et al
Vegetation-destroyer....C. H. Howard
Vehicle attachment....F. R. Allen
Vehicle-body....M. R. Hull
Vehicle-body....F. Stratton
Vehicle propelling mechanism....C. F. Thayer
Vehicle running-gear....J. D. Weekes
Vehicle shock-deadener....G. Dumond
Vehicle-spring check....H. Cottrell
Vehicle storm-front....D. Argerbright
Vehicle to a frame, Means for flexibly connecting parts of a....E. J. Gulick
Vehicle-wheel....I. L. Goodrich
Vehicle-wheel....J. H. Morris
Vehicle-wheel and tire therefor..V. H. McDowell
Velocipede, Railway motor-....W. S. Hovey
Vending-machine....G. C. Yocum
Vending-machine....A. Brown et al
Vending-machine....W. Rohde
Ventilator....M. Hard et al
Ventilator....C. R. Brooks
Veterinary dental speculum....L. L. Conkey
Veterinary float....D. O. Knisely
Veterinary surgical float....C. Tietz
Vise....A. J. Pereles
Wagon, Dumping-....J. Herberling
Wagon or car, Dumping....E. C. North et al
Waistband and fly-front, Combined....F. M. Schmidt
Washing-machine driving mechanism....J. C. Peters
Water-economizer for jigs....T. Rowe
Water-motor and fan-blower, Combined turbine....F. C., S. H., and R. A. Douds
Wave-motor....E. W. Kapp
Wave-power apparatus....A. L. and G. A. Reynolds
Weeder or cultivator....N. P. Nelson
Weight-compensator....W. C. Stephen
Welding machine, Electric chain-..H. Helberger
Whip-lock....G. H. Voelker et al
Winding-machine....F. Meisel
Winding-machine....E. B. Bryant
Window and show-case construction, Show-....C. M. Conley
Window-screen....C. H. Knowles
Window-screen....M. Solmson
Window-screen, Automatic folding....E. S. Stanclift
Wire-connector....J. J. Walsh
Wire-splicer....G. M. Graham
Wire-working tool....F. Vsetecka
Wrench....A. G. Ely
Yarn and thread gassing-machine....J. Higginson, Jr
Yarn-testing machine....J. Moscrop
Yoke ring, Neck-....A. W. Edstrom
Zinc oxid from zinc ores, Obtaining....H. L. Sulman

DESIGNS.

Agricultural boiler....G. E. Pickup
Bridle-bits, Guard-ring for....J. H. Gregory
Candy-box....R. C. Hubbard
Censer....L. V. Aronson
Dish or similar article....G. C. Thiesen
Hinge, Screen-door....W. H. Brothers
Lace, Shoe-....C. Tweedie
Lamp, Acetylene-....F. E. Baldwin
Locket or similar article....W. G. Ginder
Pitcher or similar article....G. C. Thiesen
Portière....B. F. White
Stove, Heating-....W. Thompson et al

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MECHANICAL PATENTS.

Addresser, Envelop-....R. N. Rogers
Addressing-machines and the like, Self-feeder for....R. N. Rogers
Advertising, Automatic switching device for use in flash....L. K. Job
Air-brakes, Automatic pressure retaining and graduating release device for....E. B. Hillman et al
Amusement novelty or theatrical device....F. W. Schmidt
Animal-trap....W. P. Tippit
Animals, Treating....F. C. Goff
Annunciator....L. S. Scott
Antisnoring device....C. F. Rohwer
Apples, potatoes, &c., Device for culling and discharging....P. Huberty
Artillery-director....J. D. B. Fulton
Automobile-jack....J. C. Moore
Automobile-motor....R. R. Brown
Bail for flower-pots, Detachable....G. B. Hart
Baling-press....J. A. Hutton et al
Barrel....J. J. Henry
Barrel, Metallic....J. H. La Fave
Basin, Folding wash-....H. Barcalow
Batteries, Electrolyte for alkaline storage....T. A. Edison
Bearing, Antifriction-....H. R. Plimpton, 2d
Bearing, Steel-lined roller-....A. P. Sloan, Jr
Bed, Folding....N. Silverson
Bed-pan....G. M. White
Beer apparatus, Cooling-coil for....C. Meldau
Belt-coupling....O. N. Tevander
Bill-head or statement, Self-inclosing..J. Souder
Binder....R. J. Copeland
Binding-clip, Electrical....B. L. Barnes
Block-signal apparatus....A. Bevan
Blower, Powder-....F. B. La May
Boiler indicator, Steam-....J. F. Senter
Boll-weevil exterminator....G. W. Watkins
Book, Loose-leaf....W. P. Pitt
Books for binding, Method and means for preparing the backs of....H. D. Baumfalk
Boots and shoes, Machine for separating or indenting stitches on....M. T. Denne
Bottle, Non-refillable....G. Martin
Bottle-washer....J. T. H. Paul
Bottle-washer....G. Failing
Bottle-washing machine....J. W. Greer
Bottle-wrapper....W. D. Legge et al
Bottle-wrapper machine....W. D. Legge
Box-cover holder....W. R. A. Ball
Box-making machine....W. T. McRae et al
Box-making machine....E. L. Thurber
Box or crate....M. N. Edwards
Brake-applying mechanism....J. M. Hines
Brick-press....J. J. Nieters
Bridle....S. D. Hawk
Bridle-bit....G. F. Jungermann
Broom-holder....C. Rees et al
Broom-protector....J. Kenny
Brush, Cleaning-....R. T. Gillespie
Brush, Pneumatic....F. J. Matchette et al
Brushes and other manicuring articles, Handle of....A. C. Booth
Bucket-cleaning save-all....W. E. Potts
Buckle....I. A. Grey
Buckle, Repair-....G. A. Buchholtz
Burial-case....J. Maxwell
Cabinet, Kitchen-....J. H. Couper et al
Caisson construction....A. Z. McLeod
Calculating-machine....H. E. Goldberg
Calendar, Perpetual daily....R. Inch et al
Can-testing machine, 2 pats....O. J. Johnson
Can-top and sample-carrier, Combined....G. T. Benson
Cans, jugs, &c., Closure for oil....G. T. Tabler
Candlestick....A. A. Roland
Cane, Repeating torpedo-....R. Bean
Canvas-stretcher....J. C. Goss et al
Car-bolster, Cast-metal....G. G. Floyd
Car-brake-operating mechanism....N. Rushe
Car, Combination stock-....T. M. Crepar
Car-coupling....G. E. Starbird et al
Car for wire-rope or suspension railways, Trolley-....R. Pfaffenbach
Car-frame construction....J. J. Hennessey
Car, Rocker-bottom....H. C. Priebe
Car-stake and attaching means therefor....J. A. Toomey
Car, vestibule-door and trap....C. E. Griffith
Cars, System for automatically loading....W. J. Selleck
Carbureter....J. F. Andres
Carbureter....E. Gundelach
Carpet-cleaning machine....W. Farman
Carpet-stretcher....J. B. Logan
Carriage-top....W. J. Hoskyns
Cartridge-crimper....G. T. Phillips
Cash-register....H. S. Hallwood
Cash-register....F. and R. Degenhardt
Cement-burning furnace....W. E. Sly
Centrifugal machines, Apparatus for [illegible]....W. A. [illegible]
Centrifugal mill....H. [illegible]
Chains, Making....M. [illegible]
Chair-iron....F. C[illegible]
Channeler....C. A. D[illegible]
Channeling-machine....H. V. H[illegible]
Channels, Apparatus for removing mud [illegible]....J. P. Ermeling
Check-holding device....T. P. Sweeney
Cigar cutter and lighter....A. von Kleps
Cigarette-machine....D. J. C[illegible]ell
Circuit-breaker....P. M. T[illegible]
Circuit-closer, Mercurial thermostatic...F. Cossor
Circuit-controller, Electric-motor....J. M. Fay
Cistern....A. C. Peterson
Clamp....J. Ljungdal
Clamp for securing planks of scaffolds together, applicable also for use in connection with planks for other purposes...F. Mitchell et al
Clevis....B. W. Coo[illegible]
Clevis, Interlocking....T. Nelson
Clock, Watchman's....A. A. Newman
Clutch, Friction....B. M. W. Hanson
Clutch mechanism....R. H. Bowman
Clutch-operating mechanism....H. L. Turney
Coal, Carbonizing....W. Young et al
Cock for beer apparatus, Controlling stop....C. Meldau
Coin-registering mechanism..F. D. Powell et al
Coke bin and chute....G. F. Hurt
Collar and necktie fastener for shirt-bands....J. J. A. Miller
Collar-stiffener....M. Mann
Comb-fastening device, Hair....O. Klauser
Combs, Manufacturing cotton....R. Jowett
Commodore or closet seat..C. A. Eastman et al
Concentrator, Centrifugal....E. Hearing et al
Concrete construction, Reinforced....F. N. Comitot
Concrete, Means for reinforcing....E. G. Du Mazuel
Concrete, Preparing and storing..J. H. Magens
Concrete, Reinforcing....O. N. Mueller
Control system....G. B. Sebley
Conveying mechanism....H. C. Tripp
Cooker, Fireless....W. C. Clingen
Cooking canned goods, Apparatus for....J. P. Ritchie
Coon and mink trap....J. B. Young
Copying-machine....A. D. Klaber
Corn gatherer and picker....J. E. and J. P. Larson
Corn-husking machine....J. Hettrich
Corn-popper....N. W. Emmer
Corn-topper....S. E. Woods
Cornmeal product....E. W. Simons
Cotton chopper and cultivator....W. J. Smith
Cotton-cleaner....F. Phelps
Cotton-gin....B. Thoens
Coupling....D. McDonald
Cranes, Safety device for electric..M. R. Suliot
Crate, Banana-....T. H. Ruddiman
Cross-heads, Lubrication of....J. J. Johnson
Cultivating and root harvesting machines, Guide for row....G. F. Conner
Cultivator....S. E. Bailor
Current machines in parallel, Means for operating alternating-....M. Brooks et al
Curtain, Drop-....M. L. Sickles
Curtain-banging apparatus....T. E. Shevill
Curtain-pole....J. Williams
Curtain-shade bracket....J. W. Tatum
Cut-off, Water....W. Z. Brown
Cutting and facing tool....W. S. Watson
Dental extractor....O. Cholinsky
Dental tool....L. S. Robinson
Design-transferring apparatus....A. G. Schultz
Detaching device....A. Barna
Dish, Cereal-....L. T. Kinert
Display-case....W. A. Van Brocklin
Door-fastener....S. Olson
Door-hanger....J. H. Burkholder
Door-lock, Combination....B. J. Hofheinz
Door, Metallic....J. O. Emrich
Dredger and scraper....C. H. Gunn
Drying-cylinder....W. M. Cunmer
Dump and hopper, Combination....T. Carroll
Dye and making same, Anthracene..M. A. Kunz
Dye and making same, Red....R. Pummerer
Egg-beater....J. A. Hoffman
Egg-preserving apparatus....H. J. Wintherlich
Elastic wheel....L. A. Garchey
Electric machine, Dynamo-....C. E. Lord
Electric switch....C. G. Perkins
Electric switch....H. Drewell
Electric switch or cut-out....I. Kitsee
Electric time-switch....R. F. S. Venner et al
Electric wires, Junction-box for....L. P. Bliemeister
Electrical distributing-rack....C. A. Rolfe
Electrical register and system therefor....L. A. Schmidt
Electromagnetic waves, Means for producing....J. Murgas
Elevated carrier....A. H. Neller
Elevator....C. Bradford et al
Elevator....L. M. Shaw
Embroidering a fabric with pile-threads in patterns, Machinery for....F. Kleutgen
Engine....G. W. Wilson
Engine cooler, Gas-....F. L. Orr
Engine starting mechanism, Internal-combustion....H. A. Johnston
Engines, Charge-forming device for internal-combustion....W. Brothers
Envelop-machine....F. A. Burnett
Equalizing mechanism....F. Mueller
Erasing-shield for draftsmen....L. Hall
Exhibiting device....W. V. D. Kelley
Explosive-engine....W. H. Hooper et al
Eye-shade....J. W. Alderson
Fabric....E. Vermilyea et al
Fabrics, Means for producing selvage in loom-woven....L. E. Salisbury
Feed-packing machine....J. M. Nikolai
Feed-water governor....J. B. Mowry
Feed-water heater and purifier....J. C. Jones
Feeding mechanism....F. Mueller
Ferrous carbonate, Composition for the production of....J. K. Lilly
Ferrule, Detachable....C. A. Scott et al
Fibrous-stock feeder....S. W. Woodbury
Fifth-wheel antirattler....L. E. Hickok
Fifth-wheel antirattler vehicle....L. E. Hickok
Filaments from viscose or similar material, Producing and forming twisted..C. A. Ernst
File-ring....L. M. Morden

Filtering viscose and similar viscous substances ..... C. A. Ernst et al
Finish-remover ..... C. Ellis
Fire-alarm, Automatic ..... S. Murray
Fire-alarm system ..... M. A. Abrahamson
Fire-engine, Traction ..... W. H. Shafer
Fire-escape ..... A. Reuter
Fire-escape ..... W. R. Arnold
Fire-extinguisher ..... H. Sieben
Fire-extinguisher, Chemical, 2 pats ..... M. Breslauer
Fireplace ..... H. M. Walker
Fireplace or stove ..... E. C. L. Close
Fireproof door ..... J. O. Emrich
Fireproof wall and partition ..... J. D. Sullivan
Fishing-tackle, Automatic ..... H. A. Schmidt
Flies, Device for attracting ..... B. W. Sims
Floor ..... T. Cantwell
Floor-jack ..... G. H. Coldwell
Flour-packer ..... E. G. Staude
Foldable box ..... C. F. A. Eddy
Folding seat ..... E. Lindow
Forging and welding metallic rings, Machine for ..... J. Girlot
Fruit-conveyer ..... M. B. Dorman
Furnace charging box ..... G. A. Hassel
Furnace-door ..... H. H. Magwire
Furnaces, Hood for hot-air ..... E. O. Haskins
Furnaces of the channel type, Method of and means for utilizing the heat in ..... G. Gröndal
Furniture, Metal ..... M. E. Stockwell
Game apparatus ..... J. Brucker
Garment-supporting clasp ..... W. W. Johnson
Gas-burner ..... E. G. Van Zandt
Gas-converting process ..... G. C. Carson
Gas-meter ..... T. C. E. and W. J. Henning
Gas plants, Pressure-regulator for compressed- ..... L. Karger
Gas-producer ..... W. J. McClung
Gas-producing furnace ..... C. Gamer
Gate ..... S. D. Fry
Gate ..... K. Landan
Gear, Change-speed ..... H. Dünhölter
Gear, Differential ..... P. Steinhauer
Gear for lifting and transporting cargo and the like goods ..... S. J. E. Jörgensen
Gear, Friction transmission ..... G. T. Stamm
Gear, Transmission- ..... W. S. Hovey
Gland or swab holder ..... W. Slaydon
Glass-rolling apparatus, Wire- ..... A. Meyer
Glass-smothing compound, Plate- ..... F. H. Findon, Jr
Governing-gear for internal-combustion engines. ..... W. J. Crossley et al
Governor, Steam-engine ..... J. W. Kleinhan
Grain-binder attachment ..... M. Brown
Graphophone ..... D. Higham
Grate ..... J. Reagan
Grinding-machine ..... J. E. Fry
Grinding-machine, Fluid-pressure-operated ..... J. G. Blessing
Grinding machine Surface ..... R. C. Matthews
Guns, Combined frame and false barrel for ..... W. F. Markham et al
Hair-curler ..... W. F. Schacht
Hair-waver ..... F. W. Lowe
Harrow riding attachment ..... T. C. Tobin
Head-block plate and perch connection ..... L. E. Hickok
Head-screen ..... H. C. Harrison et al
Heading and shingle machine ..... J. and J. H. Street
Headlight, Adjustable ..... S. E. Porter et al
Heating apparatus ..... W. Schramm et al
Heels, soles, &c., Finishing surfaces of ..... W. W. Crooker
Hitching weight or anchor ..... J. H. Chamberlin
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Hose-band clamp ..... J. B. Driscoll
Hosiery, Manufacture of ..... G. H. Gilbert
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Hot-air furnace ..... M. J. Murdoch et al
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Hot-water bottles or the like, Making socket members for ..... H. P. Kraft et al
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Hydraulic press ..... T. H. Mapp
Hydrocarbon-burner ..... R. V. Hoffman
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Ice-machine press ..... D. L. Holden
Implement-handle ..... O. Kampfe
Index for books ..... G. W. Boggs
Index system, Card- ..... S. S. Bradway
Indexing or dividing head ..... E. J. McClellan
Ink-well ..... W. W. Owens
Ink-well ..... S. Wagner
Inkstand ..... W. I. Tisdale
Inking-pad receptacle ..... R. W. Roberts
Instruments, Accenting device for automatic players for ..... F. W. Draper
Insulator ..... R. C. McNutt
Internal-combustion engine ..... H. A. Miller et al
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Intestine-cleaning machine ..... F. Glas
Ironing-board ..... F. M. Bugbee
Ironing-hoard cover ..... E. Stone
Irrigation-gate box ..... R. H. Howard
Jeweler's gage ..... C. J. Dauner et al
Joint ..... H. F. Rasor
Journal-box, Lubricating ..... C. Seidel
Kiln for coking peat or similar material ..... M. Zeigler
Kite attachment ..... C. B. Carroll
Knitting machine ..... E. Lippitt
Knob fastening, Door ..... J. F. Smart
Knot-tying apparatus for bags, &c ..... C. D. Myers
Ladder and trap-door mechanism ..... T. M. Houghton
Ladder or inclined way for raising and lowering barrels, &c., Portable ..... J. Max
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Latches or other devices, Feeding mechanism for ..... H. P. Kraft
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Lock and latch ..... T. Hall
Lock or latch ..... W. V. Brown
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Locomotive turn-tables, Safety means for ..... J. W. De Long
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Mail-bag catcher ..... E. Piland
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Mail-box, Automatic ..... O. A. Larson
Mail-delivery apparatus, Rural- ..... J. M. Branham
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Match-machine ..... W. E. Williams
Measure ..... L. C. Farmer
Metals, Precipitating ..... J. E. Greenawalt
Milking-machine ..... D. T. Sharples
Miter-box ..... E. D. Bjork
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Molded articles, Making ..... H. Dresler
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Mower ..... W. W. and H. H. Hare
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Mower, Lawn- ..... E. M. Stapleton
Mowers, Cutting apparatus for ..... W. J. Needham
Music-leaf turner ..... E. P. Dorward
Musical instrument, Stringed ..... W. D. Bohnenberger
Musical instruments, Pedal connection for ..... O. Dreger
Nail-inserting machine ..... A. D. Elliott
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Nitrobenzanthrone compound and making same ..... O. Bally et al
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Nut-lock ..... C. H. Bicknell
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Oil attachment for handsaws and the like ..... F. Culbertson
Oil-burner ..... M. S. Conly
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Ordnance, Firing mechanism for ..... H. T. Wheeler
Ore-concentrator ..... P. Hárdén
Ore-crushing machine ..... J. B. Albers
Ore-roasting furnace ..... A. D. Lee
Ore-tank, Revolving ..... A. J. Garver
Packing Shaft- ..... J. Wilkinson
Pane-securing means ..... N. Fells
Paper-clip ..... M. E. Thompson
Pawl-operating mechanism, Automatic ..... W. E. Waldron
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Planter, Seed- ..... J. H. Gardner
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Plows, Level-indicator for ..... G. W. and E. Thurmond
Plowshares, Device for holding ..... P. V. Burgess
Pneumatic carrier ..... M. R. Collins
Post-binder ..... W. L. Van de Wicle
Potato digger and separator, Combined ..... R. L. Pettit
Power-transmitting mechanism ..... R. D. Mayo
Preserving ..... E. Janitzky
Press ..... N. W. Crandall
Printers' rollers and the like, Machine for cleaning ..... C. B. Cutler
Printing-press, Reciprocating-motion ..... C. L. Robinson
Printing press, Tag and label ..... F. C. Jamieson
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Pump, Oil- ..... D. F. Colldeweih
Pump operated by compressed air, 2 pats ..... D. W. Starrett
Push-button snap-switch ..... J. A. York
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Radiator mounting and connection ..... M. J. Harkins et al
Railway block-signaling system, Automatic ..... S. M. Young
Railway brake-setting apparatus ..... J. J. McNamee
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Railway journal-box appliance ..... W. F. Bentley
Railway-switch safety appliance ..... J. W. McManama
Railway system, Eleetric- ..... S. B. Rappleye et al
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Razor honing and stropping device ..... G. W. Mosby
Razor-strop or device for stropping razors or blades ..... A. Craig
Recorder ..... R. A. Wood
Reel-clamp ..... C. B. Kuhl
Reflector, Heat- ..... B. C. Oblinger
Rein-coupling ..... T. Forstner
Relay, Polarized ..... C. H. Thordarson
Release-starter, Automatic electrical ..... A. J. Burns
Retort-furnace, Regenerative ..... R. Ziesing
Road-machine ..... S. W. Smith
Roadway ..... G. A., A. J. and E. E. Mitchell
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Rolling-mills, Table-operating mechanism for ..... F. C. Biggert, Jr.
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Roost, Poultry- ..... S. Percival
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Rotary engine ..... A. F. Ford
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Sad-iron, Electric ..... W. M. Harwood
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Sash opening and closing device, Window- ..... A. Plass
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Scraper, Floor- ..... A. Kilbury
Screen and washstand, Combined ..... A. L. Jones
Screw-driver, Ratchet ..... J. P. Bartholomay
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Sealing and vacuum-releasing device, Jar- ..... J. L. Rollins
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Separator for collated articles ..... B. F. Ennis
Sewing machine, Boot and shoe ..... N. H. Murphy et al
Shackle, Lifting- ..... C. A. Terry
Shade or curtain holder, Adjustable ..... G. F. Shermer
Snarpening plowshares, disks, &c., Machine for ..... D. H. Sneed
Shoe lining, backstay, and counter ..... J. Mitchell
Shoe, Lowcut ..... W. G. Clopton
Show-case ..... J. F. Bierend
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Sign, Advertising- ..... L. J. Lungren
Sign, Street- ..... A. O. Warner
Skidding device, Slack-pulling ..... J. A. Hausfelder
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Spades, shovels, and handles, Attachment for ..... A. Fossel
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Telegraphic key ..... R. K. Patterson
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Telephone system, Non-interfering party-line ..... W. R. Brown
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Thresher and separator, Combined ..... C. and G. F. Batke
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Ticket, Railway fare and transfer ..... W. L. Riemer
Tile-fastener ..... H. L. Robinson
Timepieces, Winding-indieator for ..... A. G. Kountz
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Tube and flue cleaner ..... F. H. Lehnert
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Tubular boiler ..... W. Möller
Turbine ..... R. H. Goldsborough
Turbine, Elastic-fluid ..... J. Zvonicek
Turbine-engine ..... H. B. Fulmer
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Turbine, Steam- ..... F. A. Douse
Type, Flexible form for holding and assembling ..... S. Brown
Type, Flexible-strip form for holding ..... S. Brown
Type-writing and adding machine, Combined ..... B. C. Stickney
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Valve, Gate- ..... J. R. De Remer
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Valve, Safety- ..... J. H. Thiele
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Vehicle king-bolt connection ..... L. E. Hickok
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Ventilator-operating device ..... I. Eachus
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Vestibule door and platform controlling mechanism ..... F. C. Reynolds
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Vulcanization, Process of ..... A. O. Bourn
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Wire fabric and attaching means therefor ..... M. W. Floto
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Box ..... G. A. Kruttschnitt
Charm, pin, or similar article ..... S. R. Jacobs
Eraser ..... E. Faber
Fabric, Pile ..... F. E. Kip
Horn ..... C. H. Foster
Lace curtain ..... W. Hardy
Pedestal and jardinière ..... E. L. Collis
Rubber heel ..... W. A. Koneman
Spoon or similar article ..... W. A. Jameson
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Tiling ..... A. A. Spadone
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Brush-holders, Means for supporting.....E. D. Priest
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Crate or coop, Poultry.....T. Ball
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Cultivator stalk-cutter attachment.....H. Hestand et al
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Deodorizer-receptacle.....R. B. Emerson
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Door cheek and closer, Automatic....M. Levin
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Draft regulator and ventilator....J. W. Noxon
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Drawer-stop-inserting device..H. H. Borgerding
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Electric heater.....G. W. Elkins
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Electric machine, Dynamo-.....R. S. Feicht
Electric machine with compensating windings, Dynamo-.....L. Torda
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Electric waves, Means for receiving intelligence communicated by.....G. W. Pickard
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Electropneumatic machine.....W. K. Rankin
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Engine.....C. H. Way
Engine controlling means, Gas-..H. W. Bradley
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Envelop.....B. A. Cole
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Erasing-machine.....F. W. Lierman
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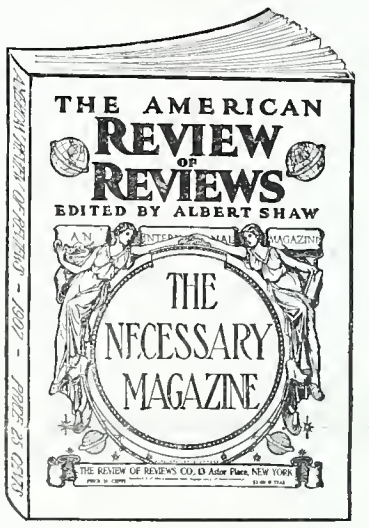
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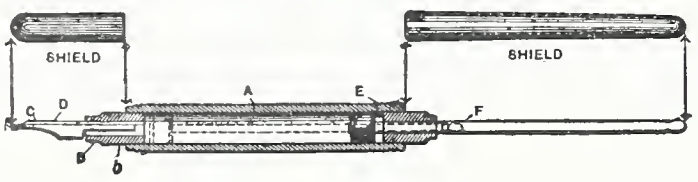
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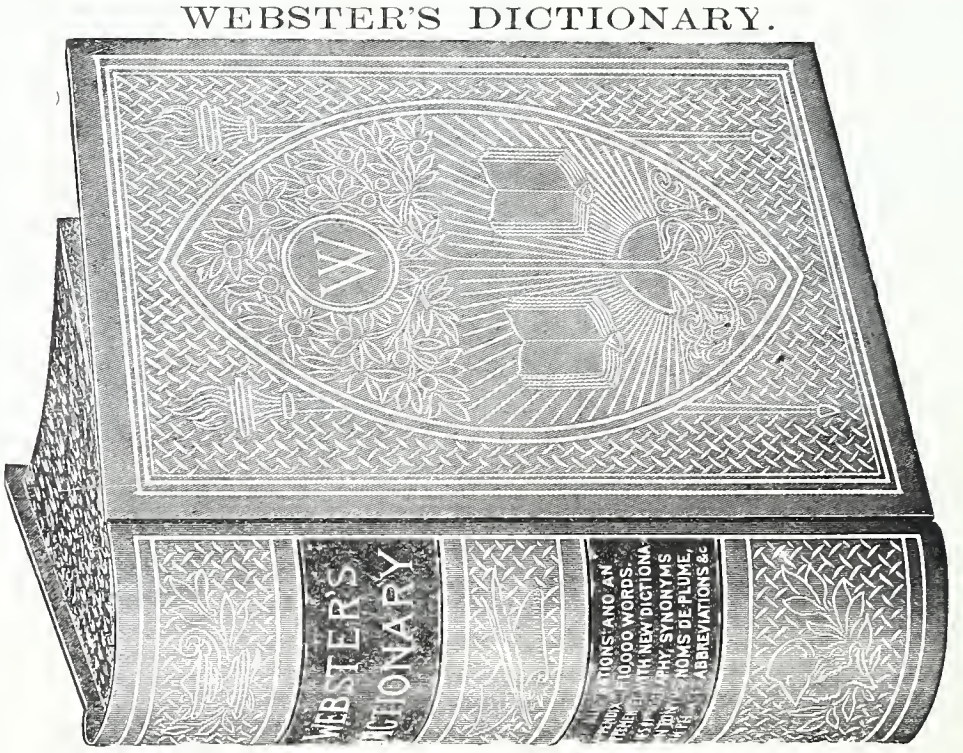


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GREAT WIRELESS STATION.

By E. OMMELANGE.

THE Slaby-Arco system of wireless telegraphy, which is the official German system, is making rapid progress all over the world. There are now 641 stations equipped with this apparatus, or 41 per cent of the entire list of existing wireless telegraph stations. Most of these installations are naturally on vessels; less than 200 being on land. The most important of the latter is the great German experiment station at Nauen, near Berlin, the radius of which is 1,860 miles.

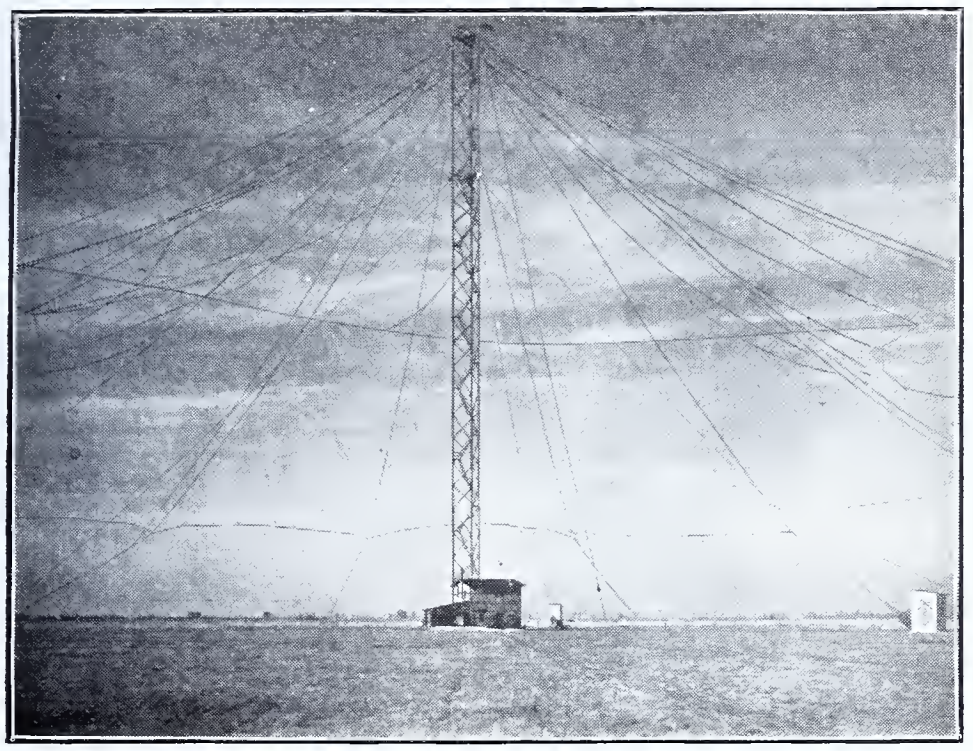


FIG. 1.—WIRELESS TELEGRAPH STATION AT NAUEN.

In the accompanying illustration (Fig. 1.) is shown the tower of this installation, which rises in the air to a dizzy height of 328 feet, or nearly as high as the dome of the Capitol. It is a steel skeleton of triangular shape, each side being 13 feet wide. It consists essentially of three vertical beams connected by diagonal tie rods. Each beam is itself of skeleton construction, consisting of two plates connected by short diagonal braces, and is made in lengths of 26 feet, which are bolted together. This construction continues from the top of the tower to about 20 feet above the ground. Here the beams converge to a ball of cast steel, which rests on a plate carefully insulated from the concrete foundation, and supports the entire weight of the tower. At a height of 315 feet above the ground, there is a platform from which it is easy to operate the three pairs of pulleys at the top of the tower by which the antenna is raised and lowered. At a height of 246 feet, three anchor cables are attached to the tower to prevent its being overthrown or broken by the wind, and to maintain it in a nearly vertical position—not exactly vertical, for the object of pivoting the tower on a steel ball is to allow it to yield to the wind by inclining 20 degrees or less from the vertical, and thus lessen the danger of being overthrown. These cables are composed of round eye-bars connected by stout pins and run to three anchorages, each of which is 656 feet from the foot of the tower. The cables are insulated throughout their entire length. In consequence of the high electrical tension—sometimes corresponding to a sparking distance of 39 inches—which exists at their points of attachment to the tower, it was necessary to employ a mode of insulation by which the cables are constantly bathed in oil. This method appears to have given excellent results. The anchorages are heavy masses of solid brickwork, carried to a height of several yards above the ground.



FIG 3.—RECEIVING APPARATUS, ATTENDANT RECEIVING A MESSAGE.

The antenna (invisible in the photographic, but shown in the accompanying diagram) is shaped like an umbrella, the tower representing the rod. It is divided into six sections, which are so balanced in pairs over the pulleys that the horizontal stresses are reduced to a minimum, and the resultant pressure is very nearly vertical. This arrangement, by the way,



FIG. 2.—DIAGRAM OF THE ANTENNA.

is patented. Each section, however, can be detached and lowered separately.

The upper part of the antenna consists of 54 wire cables, nine in each of the six sections; but at a point one-fourth its length from the ground each cable divides into three, so that there are 162 cables at the bottom. To the bottom are attached hempen ropes, which are insulated from the wires and are fastened to the ground by pegs at their lower ends. The aggregate surface of the antenna is nearly 15 acres.

From the top of the tower the nine cables which compose each section are continued in a parallel bundle to the bottom, and thence to the operating room. These fifty-four cables are not insulated from the metallic frame of the tower, which is consequently a part of the antenna.

The ground contact is made through a system of 180 wires buried in the earth. These wires, like those of the antenna, divide as they diverge, so that at the outer part of the system, which extends over about 31 acres, there are 324 wires. At the center the converging 108 wires are connected with the apparatus. The site of the station was determined by the unfailing abundance of subsoil water which assured a good "earth."

This generator, driven at the rate of 750 revolutions per minute, furnishes 25 kilowatts of electrical power in the form of a monophase current of 50 cycles per second. It contains a device which prevents the generation of a current of very high frequency.

Two cables connect the dynamo with the switchboard, to which are attached a bipolar interrupter with fusible plugs, a voltmeter, an amperemeter, an indicator of frequency and a transmitting and a cut-off relay. Four large induction coils are intercalated in the dynamo current, in addition to the four transformers which produce the high tension transmitting currents.

The transmission apparatus (Fig. 4.) includes a battery of 360 large Leyden jars, arranged three in series of 120 abreast, and having an aggregate capacity of 400,000 coulombs: an annular sparker without a blower, and an induction coil composed of spirally-wound tubes of silvered copper, with binding posts by which the amount of induction can be varied and connection made with earth and with the antenna.

Two other induction coils of high tension are intercalated in the charging circuit. The sparks are as thick as a man's arm, and their noise is deafening.

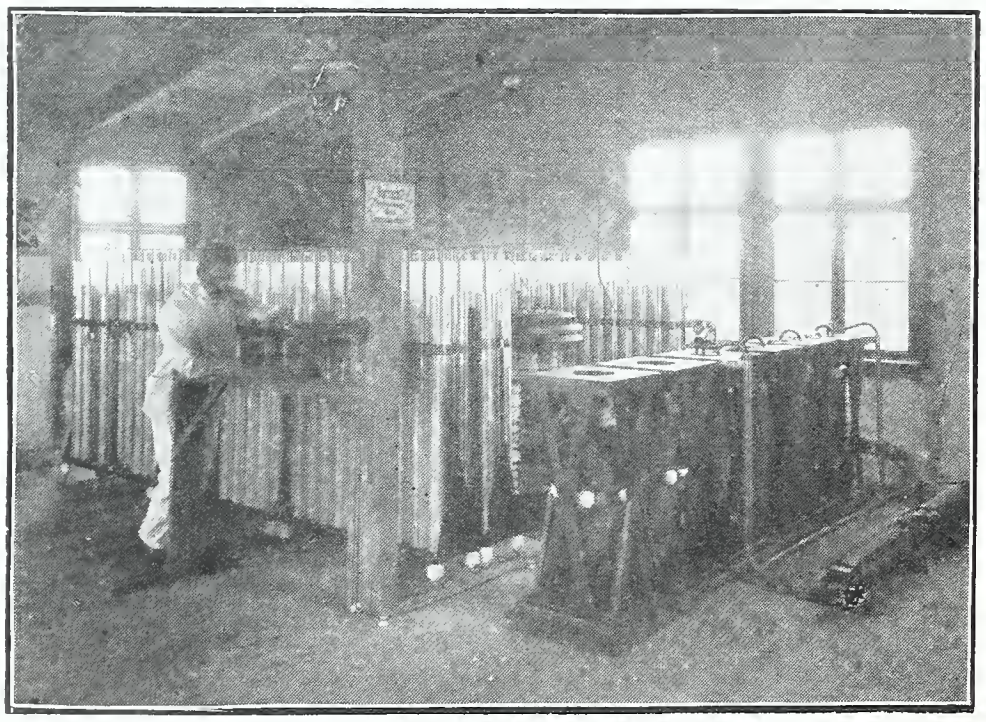


FIG. 4.—TRANSMISSION APPARATUS.

The operating rooms occupy a brick building to which is annexed an engine room. The ground floor contains the dynamo room, the transmitting office, and a workshop that may be used as a dormitory in emergencies. All the high tension apparatus is placed in the second story, where it is better protected from dampness, and hence more perfectly insulated. Another advantage of this arrangement is that the operator is less disturbed by the noise of the sparks. The building is heated by waste steam from the engine, and lighted with incandescent alcohol lamps. The interior equipment comprises the source of power, and the apparatus for transmission and reception of messages. The power is furnished by an engine of 35 horsepower. The flywheel of the engine is connected by a belt with a monophase alternator, coupled to an exciter on the same shaft.

In consequence of the very exact unison or resonance which can be established between the dynamo and the transformers, a comparatively small quantity of electrical energy is required to charge the transmitting circuit, notwithstanding its immense capacity.

To pass from the transmission to the reception of messages, it is only necessary to move a lever which puts the receiving circuit into connection with the antenna and the "earth," and simultaneously shunts the transmitting current into the cut-off relay, thus preventing the possibility of accidental transmission and protecting the coherers and detectors, which are very sensitive instruments, from the violent action of the strong transmitting current.

All the receiving instruments are mounted on one table, at the back of which, on an inclined board, are placed the condensers, induction coils, etc. This arrangement gives the operator easy control of all the receiving apparatus. The instruments are so connected that messages can be received on Morse apparatus, or by telephone, or in both ways at once.

The trial results of the station were very remarkable. The station communicated easily with steamships at a distance of over 1,500 miles, and clear messages from St. Petersburg, 840 miles distant, were obtained.

A Cure for Hog Cholera.

It will be welcome news to the farmers of our country to learn that at last a remedy—what promises to be a genuine remedy—has been found for that most uncompromising and hopeless of diseases, hog cholera. The methods that have been successfully followed in protecting human beings against small-pox, and more recently against diptheria, have been applied to hogs with hopeful results. The Bureau of Animal Industry, after experimenting with the subject for years, has proved that the contagion consists of a virus which exists in the blood of the diseased animal; but in spite of the most earnest efforts, this virus cannot be isolated. It passes through the finest filter; it escapes the searching gaze of the strongest microscope. If this virus were not so difficult to discern, protective methods might long ago have been adopted; but in spite of its elusive character, hogs can be immunized against cholera. Extensive trials show that hogs that have recovered from the disease, or have been exposed without contracting it, can be injected with suitable amounts of blood containing the virus, taken from sick hogs, and thus their immunity is heightened. The blood serum of these immunes is then used to vaccinate the hogs that it is desired to protect. The method giving the best results is to inject blood from diseased hogs simultaneously with the immune serum. By this method of vaccination, hogs are protected for several months. Arrangements are being made to co-operate with the State experiment stations in more extensive tests of serum, and it is hoped that within a short time farmers may be able to obtain this valuable remedy, either in small quantities from the department, or in the market, and that the day of the unchecked ravages of cholera is past.

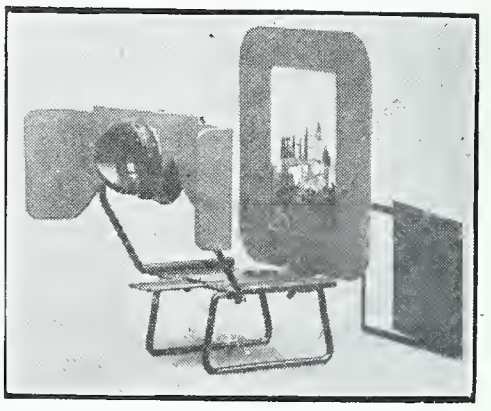
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THE VERANT: A NEW LENS.

By EMILE GUARINI.

When a photograph has been taken of an object the focal distance of which is appreciably less than the distance of distinct vision, that is to say 10 inches, an observer cannot place his eye near enough to the photograph to see the images that it represents at the same angle at which his eye would have seen the objects themselves. The verant obviates this difficulty by furnishing a distant visual image of the photograph, the various parts of which are shown to the eye at the same angle as that at which the objects photographed appeared to the lens of the camera.



In making use of the apparatus, an observer having normal eyesight sees, not the small photograph introduced into the instrument, but its distant image. This image appears free from distortion, and, except for color, has exactly the aspect of the scene photographed, giving an impression of reality that leads the observer to a correct appreciation of the distances. It is necessary, however, to carefully manipulate the screen, turning the elevated part toward the left if it be desired to make use of the left eye, and toward the right if it is the right eye that is to observe. The apparatus is then placed as near as possible to the eye, and the slide pressed with the thumb until the view appears with distinctness. If one part of the view is not distinct, the head must be slightly moved, or the direction of the screen must be changed.

The verant is also capable of being used with advantage as a weak lens or as a lens for reading.

Triumph of Electricity.

Interurban electric railways flourish in competition with steam railroads, not so much because the rates of fares are slightly lower, but because the service is more attractive to the traveling public for short trips—that is, up to, say, 100 miles. One great advantage is the absence of smoke and cinders, making the journey pleasanter; another is more frequent trains, tending to convenience of passengers; a third element in favor of the electric railways is that usual city terminals are so arranged that passengers can board the car nearer their homes and ride closer to their destination than in the case of railroads. The immediate problem of the steam road, as is pointed out by an officer of one of the trunk-line steam railroads, is to provide such service at low cost, else the older railroad must be content to see the business taken by aggressive competitors, who also contemplate attracting the freight traffic. The apparent solution is electrification of existing steam lines for passenger service.—*Western Electrician.*

A RAILWAY INTO THE OCEAN.

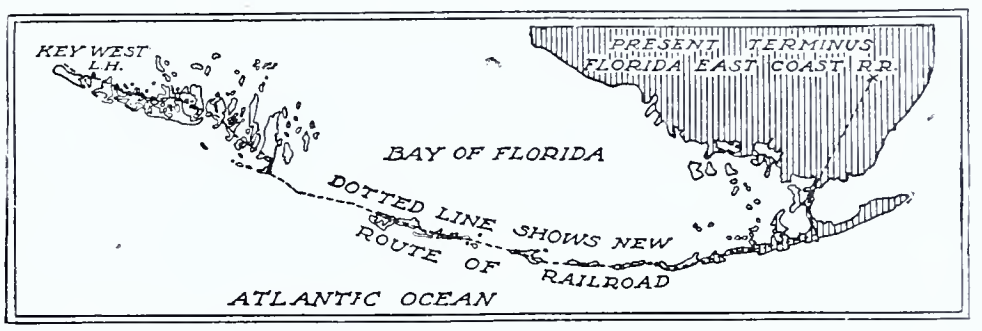
THE most picturesque enterprise in this age of startling undertakings is the railway which is being built out across the waters of the Atlantic to Key West. Passengers, as shown in the illustration, can now look out on one side across the billows of the ocean, and on the other over the waves of the Gulf of Mexico. They can enter a Pullman in Chicago, and leave it when the engine whistles for Havana, Cuba. For a hundred miles, twin lines of steel reach from one to another of the long, low coral islands which stretch away like a string of beads from the southern tip of Florida. From Key West, huge car ferries will, in a few months, convey the trains to Havana, the distance being so short that the actual ocean trip will be of only four or five hours' duration.

Henry M. Flagler, multimillionaire, who owns railways and hotels in the southern peninsula, and is sometimes called the King of Florida, is responsible for the enterprise. It occurred to him, he says, during the Spanish-American war. At that time the certainty of closer political and trade relations between this country and Cuba became evident, as did the importance of some means for quickly reaching the island republic from the United States. His views have been confirmed since the war by the great popularity of Cuba as a winter resort, and the increase in travel which demanded better means of communication.

From Miami to Key West, which is the route followed, the distance is about 160 miles; only about 65 of this rests on natural foundations. The remainder of the road is built on rock embankments and reinforced concrete arch viaducts. It may be mentioned that this is the most signal triumph of the reinforced concrete arch.

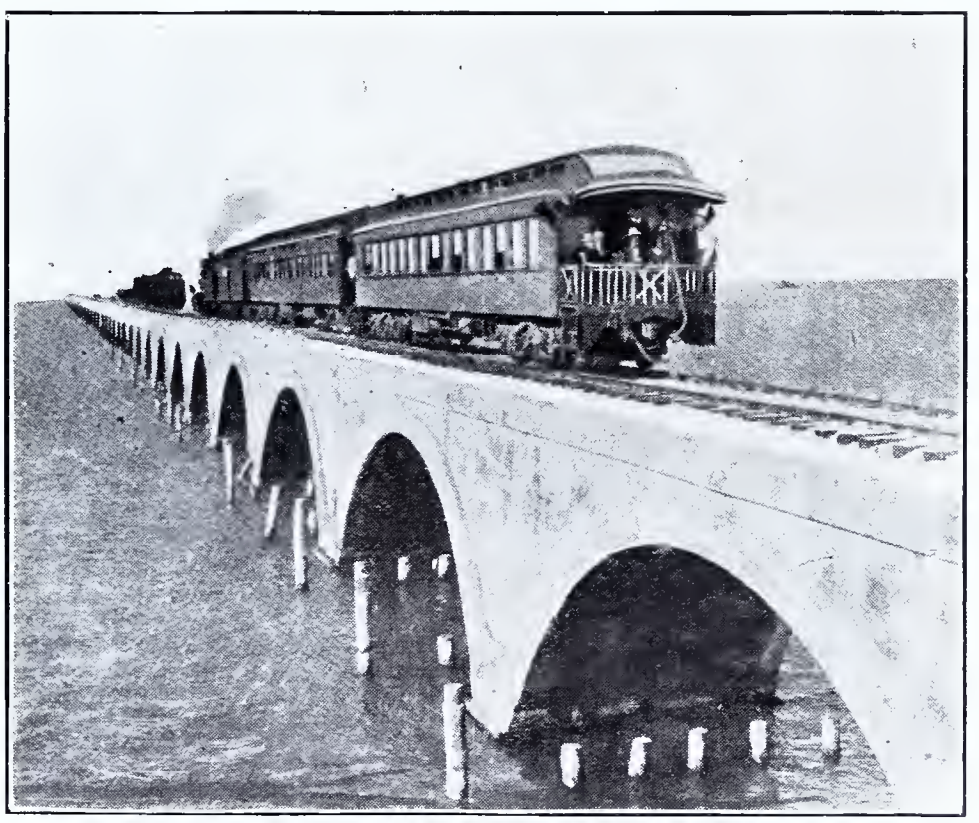
There was no precedent in the history of railway construction for the building of this sort of a road. Consequently the difficulties were many and the problems to be solved unusual. In the first place it was necessary to assemble a veritable navy of tugs, barges, steamboats, lighters, floating derricks, pile drivers and pumps, for as this was a railroad at sea, sea craft had to be utilized chiefly in its construction. Even the men who are employed on the work—an army of three or four thousand—have had to find sleeping quarters to an extent on huge houseboats or floating dormitories, and drinking water has been brought in tanks on barges from a distance of 100 miles.

On the mainland itself, along the borders of the Everglades, it was found necessary to employ barges instead of the ordinary means of land construction. The water was so shallow, however, that the heavy boats could not be floated, and canals had first to be made for them. These canals extend along both sides of the railroad and through them the barges worked their way, digging their own channels as they moved and throwing up the earth taken out so as to form the roadbed. Further down, where the railway crosses to Key Largo and begins its real career as an ocean line, problems of another sort presented themselves. Even the building of the road across the keys was not a simple matter, for a jungle of vines, palms, etc., had to be cleared before digging could begin. About thirty of these small islands (see maps) afford short stretches for the road, Key Largo being the largest, 16 miles across.



MAP SHOWING ROUTE OF FLORIDA EAST COAST RAILWAY EXTENSION TO KEY WEST.

The water intervening varies from a few hundred to several thousand feet in width, and from one to thirty feet in depth. In the shallow portions the dredges throw embankments from key to key, which are rip-rapped with rock to prevent washing and make a permanent structure. Where the water becomes deep and exposed, however, the concrete arch construction has been adopted. There are four viaducts, and the first will have a length of 10,500 feet, and consist of 184 arches.



THE FIRST PASSENGER TRAIN OVER THE VIADUCT.

The water varies in depth here from 13 to 20 feet, and the tide under normal conditions flows at the rate of four miles an hour. In order to place the roadbed out of reach of the highest waves, the top of the viaduct will be 31 feet above high water.

In constructing these arches, pile drivers drive 28 piles into the coralline limestone rock which forms the bed of the ocean at this point. After the drivers pass on to the site of the next pier, a coffer dam is lowered from a giant catamaran into place around the piles. By means of a long pipe that extends to the bottom of the coffer dam, a ceiling of concrete is laid to a depth of 3 feet. When this hardens, the water is pumped out and the pier forms set in place around the piles that have been previously cut to low-water mark.

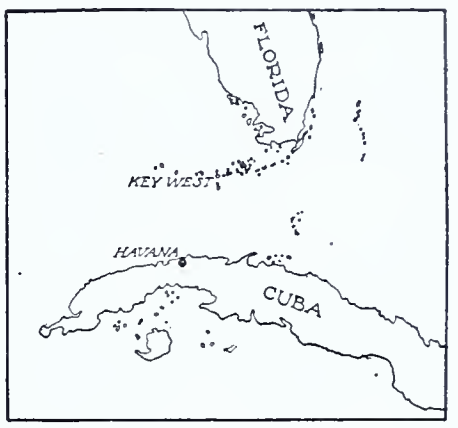
The catamaran now passes on to the next set of piles, its place being taken by a mixing machine with its accompanying barges loaded with cement, crushed rock, sand, reinforcing rods and tanks of fresh water. Salt water is not used on account of its deteriorating effect on the steel reinforcing rods. The mixing machine is provided with two sets of steam derricks, one to collect the ingredients and place them in the mixer, and the other to transfer the concrete to the forms. Reinforcing rods are wired in place, and the pier form filled with concrete, hermetically sealing the piling. The pier forms are left in place for three weeks. In spots where the rock is too hard for pile driving, an excavation is made to a depth of several feet, and the base of the pier securely anchored therein.

On a float just wide enough to permit its passage between two piers, is the arch form. The float is towed into place, and by means of jacks the form is lowered till it rests on the piers. The spandrel wall forms, made up of several sections, are now set in place. Both arch and walls are reinforced with corrugated bars. Reinforcing rods in the arch are connected in one long piece by means of welded links and wedges. Cross-rods are now wired into place, their ends entering and forming part of the spandrel wall reinforcing plan.

After they have passed on the construction of the forms, two giant mixing machines with their barges are warped in place alongside. Concrete is rapidly deposited in the forms, where it is tamped by the construction gang. The arch and spandrel wall forms are left in place for several weeks. So well are the forms made and the work done that no pointing-up is necessary when the forms are removed.

Shifts of men are employed by day and night, and the work is progressing at the rate of one arch, or 50 feet a day.

Although Key West is the projected terminus of the road, Knight's Key, 25 miles farther from Havana, will be used as a temporary terminus until the remainder of the road is completed. The cut shows the first passenger train on its way to Knight's Key. It has been found that there is not sufficient space on the island of Key West to provide railroad yards, wharves, etc., necessary for a work of this magnitude, and the island has actually to be enlarged before it can be utilized. The coral insects which laboriously built up these keys will have their toil supplemented by man. A vast area is to be filled in which will add approximately 179 acres to the size of the island. These tiny insects, it may be noted, are the only partners Mr. Flagler has had in his unique undertaking. The road, from the nature of its construction, is one of the most expensive ever built, costing about $100,000 a mile, and representing a total expenditure of between $15,000,000 and $20,000,000.



MAP SHOWING RELATIVE POSITION OF KEY WEST AND HAVANA.

It has been said that E. H. Harriman regarded the Lucin cut-off across Great Salt Lake in Utah—built for the purpose of eliminating about 100 miles of track on the Union Pacific—as the monumental achievement of his life. Engineering experts, however, assert that the feat of bridging the Florida keys is a much greater one: and economic authorities declare that no similar enterprise of modern times, except the Panama canal, can be compared with it in commercial benefits to the United States.

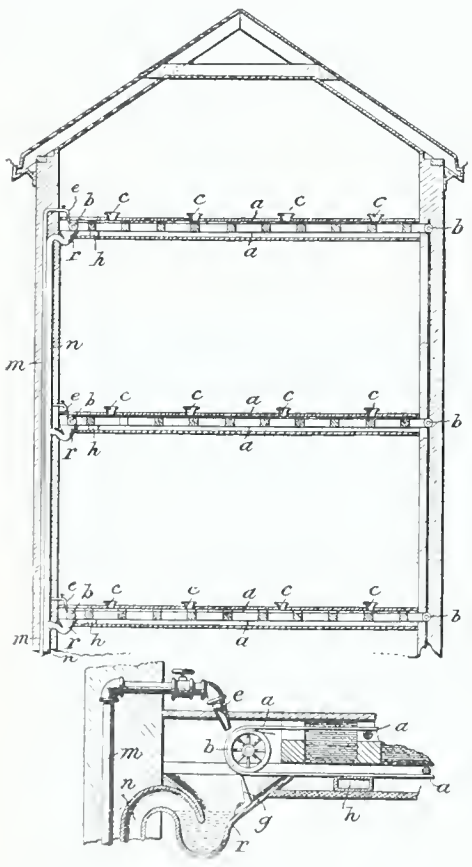
CLEVER NEW PATENTS.

Hygienic System for Disposing of Expectoration.—Spindle Driving Mechanism for Spinning Machine.—Pole Brace. Folding Pocket Coat and Hat Hook.

Hygienic System for Disposing of Expectoration.

Walter Walker, of Junction City, Kans., has obtained a patent on an unique system for the disposition of expectoration, in a hygienic manner, the apparatus or system being particularly applicable to public structures or houses, though it may be employed in streets, railway cars, and the like.

The object of the invention is to provide means which may operate in conjunction with the ordinary sewerage arrangement, for receiving the expectorations of those using the building or other place equipped with the system, at a plurality of separated places or points, and conveying the



same immediately to a receiving station, where the carrying member is thoroughly cleansed, the matter deposited thereupon being removed and preferably transferred to a receiver forming a part of the ordinary sewerage system. By the immediate transportation of the spittle and the like, deposited at the various points to the discharge station, the same is not permitted to dry, and the dissemination of any micro-organism therein is consequently prevented, thus materially lessening the danger of the communication of phthisis and similar diseases by infection.

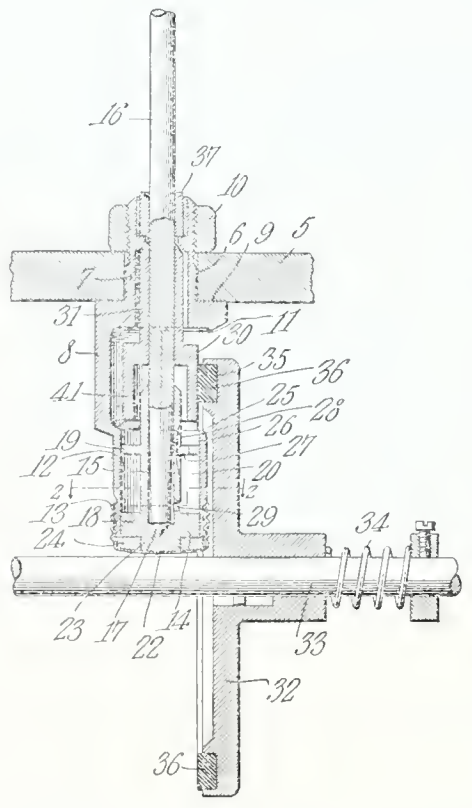
The system, as proposed for buildings, is shown in the accompanying illustration. A vertical pipe *n* is arranged in the wall and leads to a sewer or other receiver. At the different floors, funnels *r* are connected to the pipe. Beneath the floors operate an endless belt *a*, and receiving funnels *c* are located in the floors directly over the belts. The ends of the belts are arranged above the funnels *r*, and jets of water are directed against the same by suitable nozzles *e*, which are supplied with water from pipe *m*. The belts are continuously operated, and therefore any spittle or any foreign matter, deposited in the receiving funnels *c*, is directed by the same to the belts whence it is carried by the belts to the funnels *r*, into which it is washed by the jets of water, and from thence it is carried into the sewer.

When the system is installed in a city, a pair of belts *a* is preferably used upon each square, one member of each pair being arranged to travel adjacent to the outer edge of each pavement a slight distance below the surfaces of the same, being guided upon end and intermediate rollers in a similar manner to that described.

Spindle Driving Mechanism for Spinning Machine.

An improvement in spindle driving mechanism constitutes the subject-matter of a patent granted to Mr. Wm. Taylor Noah, of Elon College, N. C. The object of the invention is to improve and simplify the construction of the bolster and its associated parts, and further to provide a novel form of step or bearing for the lower end of the spindle.

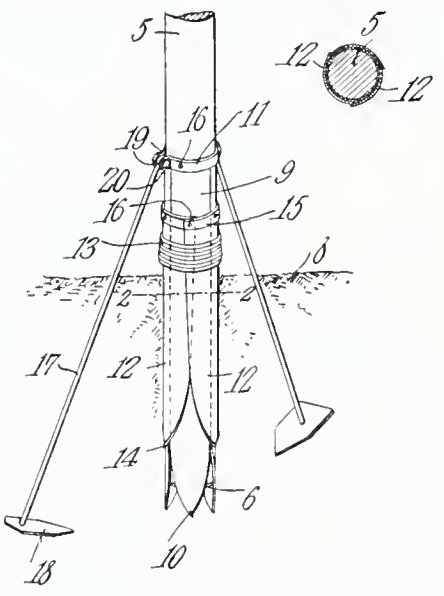
The accompanying view is a vertical section through the improvement. The bolster rail is shown at 5, and the bolster 8 is fastened in the rail, as illustrated. This bolster depends below the rail, and has an opening in one side. The bearing for the spindle 16 is shown at 17, and includes an upstanding sleeve 41 provided with a lower head 14 that fits within the lower end of the bolster, and is held in place by a cap 22. The driving shaft is illustrated at 33, and carries a friction driving wheel 32 keyed thereto, and urged toward the bolster by means of a spring 34. This drive wheel has a suitable cushion 36 on one side that engages the whirl or friction wheel 30 fastened to the spindle. When oil or other lubricant is introduced in the



cup 26, it later will flow through the openings 27 and 29 into the bore 18, and thus thoroughly lubricate the bearing 17. By removing the cap 22, the step spindle and its associated parts may be withdrawn from the bolster through the threaded end of the latter, said cap not only forming a support for the step, but also serving as a closure so as to effectually exclude the entrance of dust and dirt to the bearing.

Pole Brace.

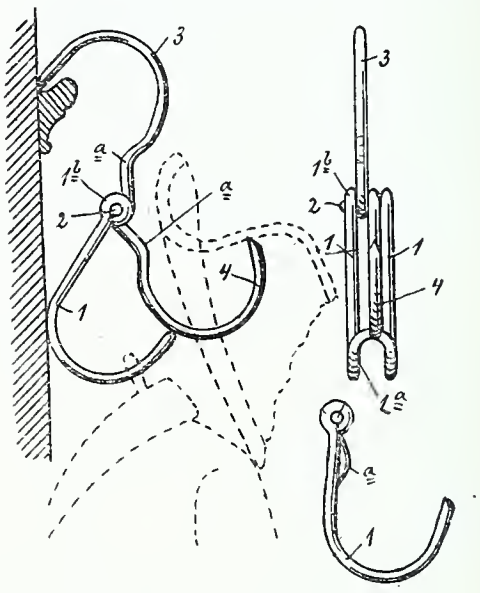
Dennis C. Van Buren, of Grangeville, Idaho, has secured a patent on a pole brace, designed for use on telegraph and telephone poles, fence posts and similar supports, and adapted to re-enforce and strengthen the same at the base thereof, so as to prevent such poles from rotting and breaking off at the ground line. The accompanying illustration discloses



one embodiment of the invention applied to a pole 5, having a rounded lower end 6, and embedded in the ground 8. The invention consists of a tubular casing or housing, formed by a plurality of metallic strips 9, curved to conform to the configuration of the adjacent faces of the pole, so as to encase and protect the latter and thereby prevent the pole from rotting or decaying. The lower ends of the plates 9, which are extended beyond the pole, are tapered to form piercing points 10, while the upper ends of the plates 9 are bent upon themselves to provide an annular re-enforcing flange 11, which constitutes a driving head, when the casing or housing is placed on a pole after the same has been embedded in the ground. The device is equipped with an auxiliary casing composed of plates 12, which overlap the adjacent longitudinal edges of the plates 9 to re-enforce and strengthen the pole and to prevent the moisture from penetrating the inner casing or housing. The plates 12 of the auxiliary casing, which are of a length less than the plates 9 of the inner casing or housing, are rigidly clamped thereon by a binding wire 13, adapted to form an additional re-enforcement for the pole at the ground line. The pole is held against lateral strains by inclined braces 17, provided at their lower ends with terminal anchoring shoes 18, and having their upper ends pivoted between lugs 19 of the re-enforcing flange 11. The anchoring shoes are embedded in the ground, and the lugs 19 are pierced by bolts 20, which constitute the pivots for the upper ends of the braces 17.

Folding Pocket Coat and Hat Hook.

A simple folding coat and hat hook which can be folded and carried in the pocket has been patented by Mr. Wm. H. Lewis, of Rome, N. Y. A doubled or two-part hook 1 formed of a looped wire is provided, and has its terminals connected by a pintle 2. On this pintle and between the sides of the two-part



hook, are pivoted two other hooks 2 and 3 that have offsets *a*. These hooks are arranged to fit between the parts of the doubled hook, and when so disposed the device can be carried in the pocket. In use, one of the hooks, either 3 or 4, is adapted to be engaged with a shelf, molding or other projection, whereupon the other two constitute respectively the coat and hat engaging means, as indicated in dotted lines in one of the views. The lower view shows the device in its folded position.

PATENTS

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

BUZBY v. DAVIS et al.

(Circuit Court of Appeals, Eighth Circuit. November 7, 1906. 150 F. R. p. 275.)

1. TRADE-MARK — SYMBOL OF KEYSTONE PROPER AND INFRINGEMENT ACTIONABLE.

The symbol of a keystone of an arch is susceptible of exclusive appropriation as a trade-mark, and its use by another upon similar products after such adoption and registration by the owner, is an infringement of his monopoly and remediable in equity.

2. SAME—USE OF WORD "KEYSTONE" MAY CONSTITUTE UNFAIR COMPETITION AND BE REMEDIABLE.

Conceding, but not deciding, that the word "Keystone" is a geographical term and not susceptible of monopolization as a trade-mark, yet its use by one manufacturer in his trade-name or on his products to palm them off as those of another, may constitute unfair competition and entitle the latter to an injunction and damages.

3. SAME—USE OF GEOGRAPHICAL AND DESCRIPTIVE WORDS MAY CONSTITUTE UNFAIR COMPETITION.

The use of geographical or descriptive terms to palm off the goods of one manufacturer or vendor as those of another may constitute unfair competition, and may be lawfully enjoined by a court of equity to the same extent as the use of any other terms or symbols.

4. SAME—FACTS—CONCLUSION.

A bill contained averments that the complainant made and sold oils and lubricants for 19 years under the name "Keystone Lubricating Company" until his products became known throughout the markets of the world as Keystone oils and lubricants, that after his trade had been established 17 years and his trade-name and his products were known as the Keystone Lubricating Company and the Keystone oils and lubricants, respectively, the defendants, for the purpose of deceiving purchasers and selling their goods as those of the complainant, commenced and continued to make and sell less costly and inferior oils and lubricants under the name Keystone Oil Company, and have succeeded and are succeeding in this way in palming off their products as those of the complainant. Held, the use of the word "Keystone," as alleged in the bill, constituted unfair competition and entitled the complainant to relief in equity.

ROBINSON v. AMERICAN CAR & FOUNDRY CO.

(Circuit Court of Appeals, Seventh Circuit. Jannary 2, 1906. 150 F. R. p. 331.)

1. PATENTS-INFRINGEMENT-ACTION-PLEADING-MOTION FOR JUDGMENT ON PLEADINGS-REPLICATION—SUFFICIENCY.

The declaration in an action for infringement of a patent alleged the proper issuance of the patent. Defendant filed a plea, setting up in bar a decree entered in a prior suit in equity between the parties for infringement of the same patent dismissing the bill for want of equity, and alleging that the device relied on as an infringement was the same in both suits. The latter allegation was denied by replication. Held, that the sustaining of a motion by defendant for judgment on the pleadings, was error, since the court could not know without proof that the decree determined the invalidity of the patent, and the plea was met and an issue of fact raised as to the identity of the causes of action by the replication.

AMERICAN SALES BOOK CO. et al. v. CARTER-CRUME CO. Limited, et al.

(Circuit Court of Appeals, Second Circuit. Dec. 4, 1906. 150 F. R. p. 333.)

PATENTS — ANTICIPATION — MANIFOLDING SALESBOOK.

The Beck patent, No. 647,934, for a manifolding salesbook and holder, the purpose of the improvement being to enable the user to manipulate or remove the leaves of the pad without soiling the fingers on the carbon transfer sheet, which is accomplished by cutting away the corner of such sheet, is void for anticipation by the prior Mooney book and the Oldfield patent, No. 517,359: the books in both cases having a notch in the carbon sheet, and being capable of use in the manner contemplated by the patent—the first without alteration, and the second without alteration, or by a mere change in the location of the notch, and it being shown that they were in fact so used.

O'ROURKE ENGINEERING CONST. CO. v. McMULLEN et al.

(Circuit Court, S. D. New York. February 6, 1907. 150 F. R. p. 338.)

1. PATENTS—IMPLIED LICENSE TO USE PATENTED ARTICLE.

Where a company is licensed by the one patentee to make and sell a patented article, and the president of the company, owning another patent for a device used in and as a part of the same patented article, sells a large number of such articles, made under, and in accordance with such patents, with the statement that the company is duly licensed, there is an actual license as to the one patent, and an implied license as to the other which will protect the users from the charge of infringement of either.

2. SALE-SUIT FOR INFRINGEMENT-PROOF OF LICENSE.

Where large numbers of an article containing a patented device are made and sold under circumstances which carry an implied license from the patentee to use the same, in a suit by a subsequent owner of the patent for infringemeut against a user of one of such articles which has been long in use, the defendant cannot be required to prove beyond a reasonable doubt that the article owned and used by him is one of those covered by the implied license.

3. SAME—INFRINGEMENT — REPAIR OR RECONSTRUCTION.

The replacing by a purchaser and user of a patented article of a part which is peculiarly subject to wear or destruction, and which does not constitute a chief element of the patented invention, is within his rights as a repair, and cannot be considered a reconstruction to subject him to liability as an infringer.

4. SAME—AIR LOCK FOR CAISSONS.

The Moran patent, No. 500,149, for an air lock for use in work carried on under air pressure greater than that of the atmosphere, construed, and claim 2 held not infringed by a structure in which no stuffing box is attached to the rope fall which carries the load being hoisted out from the caisson through the air lock, nor any equivalent therefor. Claim 3 held void for lack of invention.

5. SAME.

The Barr patent, No. 514,843, for an air lock for caissons, held void for lack of invention as to claims 1, 3, 4, 6, and 8.

PRESSED PRISM PLATE GLASS CO. v. CONTINUOUS GLASS PRESS CO.

(Circuit Court, W. D. Pennsylvania. Feb. 1, 1907. 150 F. R. p. 355.)

PATENTS—VALIDITY AND INFRINGEMENT—APPARATUS AND PROCESS PATENTS—PLATE PRISM GLASS.

The Ripley and Wadsworth patents, Nos. 661,025 and 661,024, for a process and apparatus, respectively, for making glass plates with prisms on one surface in two operations, which consist of first rolling the plate or sheet of glass and then pressing the same by means of a die while still plastic to produce the required prism pattern, were not anticipated and disclose invention. Both also held infringed. Patent No. 661,023 to the same patentees for the product of such process and apparatus as a new article of manufacture is void for anticipation; such article being already known and made, and that made by the patented process being, at most, only an improvement upon that of the prior art.

LIDGERWOOD MFG. CO. v. LAMBERT HOISTING ENGINE CO.

(Circuit Court, D. New Jersey. January 30, 1907. 150 F. R. p. 364.)

1. PATENTS — INFRINGEMENT— CABLE CONVEYORS.

The North patent, No. 480,029, for a conveying apparatus, relatiug to cable conveyors, and the essential feature of which is a self-propelling and self-distributing fall-rope carrier, was not anticipated and discloses invention. Also held infringed.

2. SAME—INVENTION.

The Dusedau patent, No. 548,973, for a cable-hoist, is void for lack of invention.

3 SAME-INFRINGEMENT-EQUIVALENT PARTS.

Two wheels or pulleys connected together so as to revolve as one by bolts or other close fastenings, and a single wheel cast with two peripheral contacts, are mechanical equivalents, where they operate in the same manner to produce the same result, and the substitution of one for the other in a patented device does not avoid infringement.

DAVIS & ROESCH TEMPERATURE CONTROLLING CO v. TAGULIABUE et al.

(Circuit Court, E. D. New York. December 31, 1906. 150 F. R. p. 372.)

PATENTS—AGREEMENT TO ASSIGN FUTURE INVENTIONS—CONSTRUCTION.

An assignment by an inventor of certain patents and inventions covered by pending applications, "and any and all inventions of like nature or similar thereto which I have already completed or which may hereafter be completed by me," does not charge a third person with notice that it was intended to cover inventions, which, though similar in character, were not then in existence or even conceived, so as to deprive him of protection as a bona fide purchaser of a patent for an invention made by the assignor afterward, and while in the employ of such third party.

WAY v. HYGIENIC FLEECED UNDERWEAR CO. et al.

(Circuit Court, E. D. Pennsylvania. Feb. 6, 1907. 150 F. R. p. 374.)

PATENTS—INVENTION — CHEST AND NECK PROTECTOR.

The Way patent, No. 593,954, for a chest and neck protector, claim 2, which describes a collar with a depending flap attached thereto at its upper edge for a portion of its width, all made of knitted fabric, is void for lack of invention.

G. RICORDI & CO. v. HAMMERSTEIN.

(Circuit Court, S. D. New York. January 2, 1907. 150 F. R. p. 450.)

COPYRIGHT-SUIT TO ENJOIN PRODUCTION OF OPERA-GROUNDS FOR PRELIMINARY INJUNCTION.

A preliminary injunction to restrain defendant from producing a copyrighted opera denied, on evidence tending to show that defendant had orally been given or promised a license for the production at a stated royalty by complainant's authorized agent, and further evidence showing without contradiction that there had been negotiations for such license, and that both complainant and its agent had full knowledge that defendant was engaging singers and expending large sums of money in preparing for the production, and did not make any objection or suggest any obstacle to the granting of a license until a considerable time after defendant's public anuouncement of the production, although in the meantime, while defendant's preparations were going on, au exclusive license had been granted to another manager.

ELITE POTTERY CO. v. DECECO CO. et al.

(Circuit Court of Appeals, Third Circuit. January 16, 1907. 150 F. R. p. 581.)

PATENTS—SUIT FOR INFRINGEMENT—PRELIMINARY INJUNCTION.

The granting of a preliminary injunction restraining infringement of a patent by a former licensee thereunder, held within the discretion of the court where the validity of the patent had been sustained by a Circuit Court of Appeals and the defense was its invalidity by reason of anticipation.

PENNSYLVANIA GLOBE GASLIGHT CO. v. CLEVELAND VAPOR LIGHT CO.

(Circuit Court, D. Rhode Island. February 9, 1907. 150 F. R. p. 583.)

PATENTS-INVENTION- INCANDESCENT BURNERS.

The Campbell patent, No. 447,757, for an improvement in incandescent burners and method of using the same, claim 2, which covers the combination in a portable lamp of a Bunsen burner, a Welsbach mantle, aud a gasoline vapor generator, the entire device above the orifice of the generator being that of Welsbach, is void for lack of inventiou; the gas generator itself being old, and it having been open to the inventor of the Welsbach device to use any known form of gas generator, stationary or portable, to feed his Bunsen burner. If conceded invention, the patent is void for anticipation by the British patent to Siemang, No. 8097, of 1886.

THOMSON-HOUSTON ELECTRIC CO. v. STERLING-MEAKER CO.

(Circuit Court, D. New Jersey. February 2, 1907. 150 F. R. p. 589.)

PATENTS—VALIDITY OF REISSUE—LACHES.

The Van Depoele reissued patent No. 11,872 (original No. 495,443), for a traveling contact for electric railways, is void because of the delay in makiug application therefor, which was not until seven years after the issuance of the original, aud more than three years after it had beeu delcared invalid by a Circuit Court of Appeals, during which time the owner was prosecuting suits for infringement in other circuits, which also terminated adversely before the application was made.

DE LONG HOOK & EYE CO. v. FRANCIS HOOK & EYE FASTENER CO.

(Circuit Court, W. D. New York. October 5, 1906. 150 F. R. p. 597.)

PATENTS—INFRINGEMENT—HOOK AND EYE PACKAGE.

The Richardson patent, No. 676,524, for a hook and eye package, in view of the limitation placed thereon by the Patent Office and acquiesced in by the patentee, is of narrow scope, and restricted to the precise method shown of securing a card carrier, in combination with a row of hooks and eyes secured to said card by two rows of thread stitching, a series of invisible eyes by one of said rows of thread stitching; the operation of securing the same being one with that of securing the hooks and loop eyes. As so construed, held not infringed.

DODGE COAL STORAGE CO. v. NEW YORK CENT. & H. R. R. CO.

(Circuit Court of Appeals, Second Circuit. January 7, 1907. 150 F. R. p. 738.)

PATENTS-INVENTION-STORAGE APPARATUS.

The Piez & Beaumont patent, No. 668,960, for a storage apparatus designed to remove and convey material such as coal from one pile or fixed point to another, and No. 688,111 to the same patentees for an improvement thereon, are void for lack of pateutable inventiou; the structure being merely the adaptation of well-known devices to a special purpose, which required uo more than engineering skill.

CONTINENTAL PAPER BAG CO. v. EASTERN PAPER BAG CO.

(Circuit Court of Appeals, First Circuit. December, 24, 1906. 150 F. R. p. 741.)

1. PATENTS — INFRINGEMENT — PAPER BAG MACHINE.

The Liddell patent No. 558,969, for a paper bag machine, held valid as against the claim of prior invention by Claussen, who obtained patent No. 598,497 upon a later application, and also infringed by the machine of the Claussen pateut.

2. SAME—SUIT FOR INFRINGEMENT—EQUITY JURISDICTION.

The fact that the machine of a patent has never been put into commercial use does not preclude the owner of the patent from maintaining a suit in equity to enjoin its infringement.

SCOTT et al. v. LAAS et al.

(Circuit Court of Appeals, Seventh Circuit. Jan. 2, 1907. 150 F. R. p. 764.)

PATENTS—SUIT FOR INFRINGEMENT—PRELIMINARY INJUNCTION.

A decisiou of the Supreme Court of the District of Columbia on appeal affirming that of the Patent Office in interference proceedings involving the question of priority of invention is a sufficient reinforcemeut of the presumption of validity arising from the grant of the patent to authorize a court, in its discretion, to grant a preliminary injunction to restrain infringement of the patent by the unsuccessful contestant, where the only defense made is that of priority of invention, and iufringement is uot denied.

AMERICAN SULPHITE PULP CO. v. DE GRASSE PAPER CO.

(Circuit Court, N. D. New York. February 12, 1907. 151 F. R. p. 47.)

PATENTS—INVENTION—WOOD PULP DIGESTERS.

The Russell reissue patent, No. 11,282 (origiual No. 445,235), for an improvement iu wood pulp digesters which consists iu applying to the inner surface of the metal shell of such a digester a continuous liuing or coat of adhesive acid-resisting material applied in a plastic conditiou to protect the shell from injury by the acid solution used in such digesters, is void for lack of patentable invention, in view of the prior art, which disclosed a similar cemeut lining employed for the same purpose in open vessels used for heating acid solutions; all that is claimed by the patentee being the discovery that it is equally effective under the increased heat and pressure to which it is subjected in pulp digesters, which discovery did not constitute iuvention. Claim 1, conceding its validity, held not infringed.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Jas. W. Howard, inventor: Howard Electric Blasting Machine Company, assignee, Connellsville. Pa. Electric Fuse Igniting Apparatus.—The principal object of the invention is to provide a very simple apparatus of a novel nature, wherein a battery is employed for generating the electric current, the parts of said apparatus being few in number and compactly arranged so that the instrument. as a whole, will occupy but very little space and is convenient to handle and operate. It consists in the combination with a casing, of a battery located therein, a key switch carried by the casing, connections for the line fuse wires also carried by the casing, and an electric circuit including the battery, the connections and the switch.

James D. Harris, inventor; Wm. E. Wimpy, assignee, Atlanta, Ga. Insect Exterminator.—The invention relates to means for exterminating insects such as bed-bugs, roaches and the like, which inhabit cracks, crevices, or other small crannies, and the object is to provide a novel, simple and handy implement which will generate dry steam and will permit the direction and introduction of such steam into the places harboring the insects and their eggs, so that both will be destroyed. It consists in the combination with a base, of a fluid reservoir, an oil reservoir mounted on the base, a burner carried by the oil reservoir, a chimney located over the reservoir and surrounding the burner, means for supporting the chimney from the base, a door forming a part of the chimney and when opened permitting the removal of the burner, and a pipe connected to the fluid reservoir and passing through the chimney over the burner.

James H. Gressom, North Hudson, Wisc. Vehicle Running Gear.—The invention relates more particularly to the coupling between the front axle, the reach, the bolster and the tongue, and is so constructed that the bolster has an entirely free and independent movement from the coupling members, though supported thereby, so that a body or rack mounted upon the bolster can be easily thrown to one side or the other and readily removed, said independent movement of the bolster being also a very desirable feature when the vehicle is traveling over rough roads, as it avoids a great many strains which would be otherwise imparted to the running gear. The invention comprises pivotally associated coupling members, a bolster located upon the members, and a pivot carried by the bolster and having an engagement with said members.

Henry P. Watson, Louisville, Ky. Nut Lock.—The object of this device is to provide a structure whereby a nut can be securely locked against detachment upon a shank, but may be released, removed, and replaced, if desired, without injury to the nut, shank or locking means, said structure, furthermore, being very simple and readily applicable to various types and forms of nuts, bolts, and the like. The invention consists of a threaded shank having a longitudinal slot in one side for the reception of a dog, a socket deeper than the slot and located at the inner end thereof, and a bearing lug located in the slot and separating the socket and slot, said lug being located directly at one side of the socket, terminating short of the outer face of the shank, and having a rounded outer bearing face, in combination with a spring-locking dog located longitudinally in the slot and having its inner end bent around the lug, which constitutes a fulcrum for the dog, said end bearing against the lug and being seated in the socket for holding the dog against longitudinal movement in the slot. said dog furthermore having its outer side projecting beyond the shank. and means extending over the inner end of the dog and likewise over the bearing lug and the portion of the dog engaged therewith, to hold said dog in the seat and in engagement with the lug, and a nut threaded on the shank and having recesses in its inner side, said dog being yieldingly projected into the recesses and thereby holding the nut against turning in one direction on the shank.

Julius S. Jordan, Round, S. C. Chop Grader.—It is the aim of the inventor to provide a simple apparatus of the above character. which will efficiently separate the different grades of material, will remove therefrom the chaff and like refuse, may be thoroughly inspected and readily cleansed, and may be conveniently located to discharge the material from either side of the machine. The invention consists in the combination with a concave bed comprising screens having meshes of different sizes, of a rotatable body located over the bed, and a worm secured to the body and comprising a core formed of cordage that is wrapped spirally upon the body, and a spiral flap comprising sections of flexible material, each section being secured at one edge to the body and having their opposite free edges in engagement with the screens.

Rev. Robert C. Williams, Coaldale, Pa. Power Transmission System.—The invention consists in the combination with spaced shafts, each having a plurality of cranks, of connections between the cranks, and idlers located between the shafts, said connections operating against the idlers during the rotation of the cranks and preventing the lateral play of said connections. By this arrangement means are provided for transmitting power from one point to another and in indirect lines, whereby practically any number of mechanisms may be connected to be driven from a common source of power.

Homer I. Clark, Allegheny, Pa. Ladies Hat Pin.—The invention relates to means for fastening hats upon the wearers' heads, and the object is to provide a novel device of a simple nature that can be readily fastened to a hat and is readily detachable therefrom, said device having hair-engaging means that is capable of being adjusted to different positions and in angular relation with respect to the hat, and constituting an efficient holder for securing such hat to the head. It comprises the combination with pivotally connected elements, of a hat-engaging pin, a hook co-operating therewith mounted on one of the elements, and a hair-engaging pin slidably mounted on the other element.

Dora King, Randsburg, Cal. Article Holding Means.—It is the object of the inventor to provide simple means of a novel nature, whereby articles can be readily applied to, and detached from, clothing, said articles being securely held in place against accidental detachment, the means being readily applicable for use with a variety of articles and being comparatively inexpensive to manufacture. This invention consists of a support including a portion having a keyhole slot, a swinging pin, and a device for operating the pin, said device extending through the slot and having an enlargement that passes through the larger portion of the slot and is of too great size to pass through the smaller portion thereof.

Benjamin F. Shafer, Chester, Pa., has obtained letters patent for an improvement in Hoisting Mechanism, particularly adapted for setting and removing telephone, telegraph and other poles or supports. The mechanism is mounted on an ordinary vehicle so that it can be transported from place to place. It comprises a rear frame and a mast or derrick, the latter being located at the rear end of the vehicle and having its upper end connected to the frame by an adjustable guide. The mast or derrick is furthermore provided at its lower end with extensible feet which can be placed upon the ground so that the weight of the load will not come upon the rear end of the vehicle. Any suitable hoisting mechanism may be employed, and is preferably in the form of a block and tackle suspended from the upper end of the mast or derrick and having means that will engage the center of the pole. With this apparatus, poles may be removed and set with ease and expedition and without the necessity of a large gang of men.

Emery W. Stroup, of Rollersville, Ohio, has obtained letters patent of the United States, for an improved pump, the object of which is to provide simple means of a novel nature whereby the pump can be vented, thus allowing the escape of gas and effecting the priming of said pump. The invention consists in the combination with a pump barrel, of a reciprocatory piston located therein and comprising a tubular body, a valve cage and seat located at the upper end of the body, and a strainer cage mounted on the lower end of the body. A valve is located in the valve cage and is movable toward and from the seat, while a stem, extending longitudinally through the body. is slidably carried by the strainer cage, said stem being adapted to engage the valve to unseat the same. A standing valve member is secured within the barrel. and has an upwardly extending cage that is located in the path of movement of the lower end of the stem.

John P. Murphy, Sacramento, Cal. has been granted a patent for an improved Score Board Indicator.—The principal object of this invention is to provide a novel and simple means, whereby the changes of the symbols may be readily made without danger of mistake or confusion, said means being such that the indicator can be manufactured on a large scale in order that it may be placed on a field, and is not liable to become deranged or inoperative either through long use or exposure to the elements. It comprises the combination with a supporting plate, spaced horizontally-disposed flanges located on the same, said plate having index designations located between the flanges. Flaps are movably mounted between the flanges, and hinge pintles, passing through the flanges, constitute pivotal supports for the flaps, one face of each flap having an indicating symbol, and each of said flaps swinging to a position over the adjacent flap when swung in one direction and exposing the symbol carried thereby.

Frank J. Gibbs, Tyrone, Pa. Two patents. Car Coupling and Trolley. The first invention relates to important improvements in car couplings, for increasing the safety of train crews and for preventing injury to the rolling stock. The car coupling is equipped with means for retaining the knuckle open and in proper position for automatic coupling, thereby obviating the necessity of going between the cars, or in front of a moving car, to set the knuckle. This device also serves to automatically open the knuckle when the locking pin is raised. Another feature of the invention resides in means for preventing the draw head from dropping to the track should it become disconnected from the draft mechanism. The knuckle-opening device consists of a spring disposed longitudinally of the draw head and connected at an intermediate point to the inner face of one of the side walls thereof, adjacent to the knuckle. The rear end of the spring is arranged to actuate the arm of the knuckle to open the latter, and the front end of the spring engages the front or outer face of the knuckle to hold the same in its open position. The draw head is provided at the bottom adjacent to its guard arm with a pendant guide, having an inclined guiding face, arranged to receive the knuckle of another draw head and forming a support for the same, when the two draw heads are coupled.

One of the objects of the second invention is to provide a trolley that will have spaced bearings upon the wire, will accommodate itself to the curves thereof and kinks therein, and will therefore more securely maintain a proper engagement with such wire. The trolley consists of the supporting pole having upstanding bracket arms with a head located between the bracket arms. A transverse substantially horizontal pivot member connects the head between its ends and the arms. Trolley wheels are located in advance and in rear of the pivot member, and axles for the wheels are carried by the head, the front axle being arranged nearer the axis of said pivot member than the rear axle, whereby the rear end of said head overbalances the front end.

Ole O. Kittleson, Lee, Ill. Two patents. Metal Hanger Blank and Force Feed Lubricator.—It is the aim of the first invention to enable hanger blanks of the same shape to be cut from a strip of sheet metal without any waste of material. The hanger blank has spaced side wings at one end, and a central wing at the other end corresponding in shape to the space between the side wings. The wings are provided with sets of openings, and the hanger blank is adapted to be used with either end up, and to have either the central or side wings bent over to form a single or a double roller hanger.

In the second invention the object is to provide means which are exceedingly simple and effective for detaching the plunger from the driving mechanism when abnormal resistance to the movement of said plunger is occasioned through any cause, thus permitting the continued movement of said driving mechanism without operation of the plunger, and avoiding the liability of breakage. The invention consists in the combination with a holder for the lubricant, of a piston operating therein, a support, a stem connected to the piston and having a threaded engagement with the support, operating means including a device rotatable about the stem, a dog for holding said device and stem against relative movement and permitting the sliding movement of the stem through the device, and means for automatically operating the dog to disengage the stem and driving device to permit the rotation of the latter with respect to the former when said stem has reached a predetermined position.

Charles H. Driver, Tarpon Springs, Fla. is the patentee of a new Turpentine Hack; one-half interest in which has been assigned to W. W. K. Decker of the same place. The object of this invention is to provide a device which will form a trough-shaped groove in the tree, will permit the ready passage of chips, and is not liable to become gummed or clogged up. It consists of a holder comprising a handle engaging shank, a body provided with an open-ended passageway therethrough, and a web dividing the front portion of the passageway and forming circular sockets therein. Tubular cutters are threaded into the sockets, said cutters projecting beyond the front end of the body and having circular cutting edges.

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FOR SALE—U. S. Patent No. 869,353, and also Canadian Patent No. 107,791. Both for same article. Both issued Oct. 1907. Brick or Elevating Truck. This truck is a great labor-saving device. Can be used in brick yards where there are brick, terracotta, fire proofing, or porous blocks, to be removed from machine or other places, on pallets, racks, or otherwise, to driers, racks or kilns. One man will do as much with this truck as four or five without it. It can also be used in foundries, factories, mills, on farms, or any place where an elevating truck is required. It will litt almost any weight, and can be made any size to suit conditions. The body of the truck lowers and raises by a downward pressure of the foot on a lever at either end. It is simple, strong, can be easily manufactured, and should be a good money maker. I will sell one or both patents. Any reasonable offer accepted. Address H. J. Dundas, Leaside Junction, Ontario, Canada. jy

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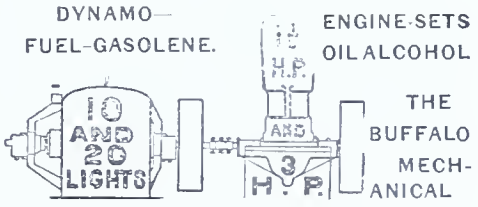
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Integrity in the Patent Office.

There is a more or less general feeling among inventors that the man with a pull, or the man with money, can get a patent a little more quickly, or better, than the poor, friendless inventor. We frequently receive letters from inventors inquiring if the use of a little money, or the services of a Congressman, would not promote a case before the Patent Office. The examiners in the Patent Office, as a class, have had the reputation of being beyond the reach of money; and as for calling on Representatives or Senators, we have always felt that this was unjust to inventors who were not in a position to command such influence. Our contact with the examiners has convinced us that they are not excelled in uprightness and probity of character—not to speak of intelligence—by the officials of any other department under the government. It is therefore a shock to read about the scandal in the Office, recently recorded in the daily press. The exact measure of the offense, however, has not been made entirely clear. As we understand it, a patent on an electric lamp had been issued to a man named Heany, of York, Pa., which, it is claimed, contained the ideas of other inventors, which had been appropriated and incorporated in this application. This would have been impossible without connivance on the part of some one inside the Office, and accordingly, it is alleged that one of the assistant examiners aided Heany and his lawyer—a Philadelphia attorney—to perpetrate the fraud. It seems that the sheets of the specification and claims of the original application were removed and destroyed, and new sheets substituted, containing matter not disclosed at the time of filing, and which had been taken from the applications of other inventors. The drawings were made over to accord with the changes in the original specification, and the old drawings destroyed. Thus an old application of Heany's was altered so as to embody the conceptions of other men. It would be impossible to effect such a result by any process of amendment. An amendment of an application must always conform to the original, and must contain no new matter. This rule of the Patent Office is as fixed and unchangeable as the laws of the Medes and Persians. But in this case, it is asserted, by substituting new drawings and rewriting the claims and descriptions of the original application, and destroying the originals, the application was changed so as to contain features not invented by Heany. Such a substitution, as before stated, could not have been effected by outsiders, but necessitated assistance from within the Office. We must confess that if the General Electric Company were not back of the complaint, we would be disposed to regard the charge more seriously; for this concern has a retained force of attorneys whose business it is to appropriate everything that they consider advantageous to their clients. We are rather inclined to urge that the case against the defendants be not prejudged—especially, as we have already noted, in view of the high standard for honesty which has always been maintained in the Patent Office. It is difficult, also, to see how the facts can be proved, if, as claimed, the original application has been destroyed; for no other copies are on file, and there is no way of ascertaining just what points the original application actually covered. The truth of the matter will doubtless come out in the proceedings which have been instituted before the courts; meanwhile, we venture to suggest to the authorities that a simple means of preventing such frauds would be to stamp every sheet of an application with the official stamp bearing the date of filing, instead of merely stamping the cover, as is the practice now. It would not be so easy to copy this stamp as to reproduce a few pages of typewriting, and such a precaution would be a safeguard to inventors in the future.

Design Patents.

Those who follow the decisions of the Federal courts can see a marked change in their attitude towards design patents. In several cases recently decided, design patents have been sustained. It is thought that this has affected the attitude of the Patent Office on the subject, for there is now a decided leaning toward liberality in the treatment of design applications. Any liberal tendency in this direction, on the part of the Office, will be welcomed. It did not take the Patent Office long to change its practice and obtain a modification of the law with respect to the granting of design patents, after the decisions of the courts some years ago, in which certain design patents were declared invalid because they were held to be mechanical inventions. If the Patent Office could respond so quickly to an unfavorable attitude of the courts, it should be equally responsive to liberal decisions on this question. This can be done without letting down the bars to the granting of patents on mechanical inventions, which was what brought about the strictures of the Patent Office on the part of the courts.

The Copyright Bill.

It remains to be seen how the recent decision of the Supreme Court in regard to copyrights on music will affect the bill now before Congress. The question at issue, as noted in the INVENTIVE AGE for last month, is a novel one in the history of copyrights: *i. e.* should protection be extended to reproductions on phonographs and similar instruments. Composers and writers of music all over the country have evinced warm interest in the matter, and a test case, involving the use of musical compositions on a pianola, was taken before the Supreme Court. The decision was in favor of the pianola company, which had objected to paying royalties on the pieces played in its machines. The court held that as the perforated sheets can only be made serviceable in connection with the pianola, and cannot be read, the reproduction of music in this manner is not a violation of the copyright law. The contest will now be transferred to the floor of Congress, and it is likely that some compromise will be effected, so as to satisfy composers as well as the graphophone and pianola companies. One objection to the bill has been that it would permit foreign composers to come to the United States and have their works protected against phonographic reproduction, while foreign countries do not give the same protection to American authors and composers. It is probable that when the bill is reported, it will contain a reciprocity clause providing that American song writers and composers may avail themselves of the United States copyright laws for the protection of their works against phonographic reproduction, but that foreign composers cannot do so unless their countries reciprocate in their attitude toward American composers.

Since the phonograph people state that half or three-fourths of their music is from foreign sources, it is thought this amendment will not meet with the same opposition that was encountered by the original bill.

Patents of Foreign Inventors.

A sweeping reform in the relations of the United States with practically all other countries, so far as patent law provisions are concerned, is contemplated by a proposition now before the House committee on patents. In nearly all foreign countries there is a law in effect providing that patents must be worked—in other words, manufactured and introduced to the public—within a certain number of years after they are granted. The object of this provison, as may be readily understood, is to ensure that the public will get the benefit of an invention. In many instances, on account of the lack of capital or for other reasons, an invention is not put upon the market during the entire term of patent protection, which means that, for a number of years, the device is lost to the people. The patent law in the United States imposes no such provision, and foreigners have not been slow to take advantage of our greater liberality. When Americans get patents in countries abroad, they are obliged to manufacture their articles within the time stipulated; but a foreigner, by securing a patent here and in his own home land, can manufacture the article there and export it to this country with the knowledge that no such article can be put on the market here in competition with him. The result is that Germany and many other foreign countries are benefited by the industrial and other activities connected with the production of articles patented by foreigners, while on the other hand citizens of the United States are prevented by the foreign patent laws from reversing the process.

This is considered a most unfair discrimination against American inventors. There is much talk of reciprocity in these days, and the House committee thinks that the arrangement should be extended to patent protection as well.

Exhibit of Safety Devices.

The widespread interest in measures and devices for protecting the lives of workmen and for promoting safety in all branches of industry is one of the most hopeful signs of latter-day civilization. This interest has taken concrete form in the establishment of a museum for the exhibition of devices for preventing accidents and ensuring the safety of workers in mining, transportation, textiles, building trades, agriculture, chemical manfacture and the like. This museum is located in a central portion of New York City, and offers an exceptional opportunity for the exploitation of safety apparatus.

Each day brings its shock of horror in the fresh tale of deaths and casualties from causes, many of which might have been avoided. In a recent statement by the Public Utilities Commission, the fact was brought out that during three and a half weeks in last August, 5,500 accidents occurred on the surface roads of New York City. This is at the rate of 211 a day or 77,000 a year, in only one of our large cities. The railway accidents in the United States, during a single year, far exceed all the casualties of the Boer war on both sides during the three years of its duration. Nor are the fatalities by any means restricted to railroads. Mining is responsible for a ghastly list of deaths; building claims an ever growing number of victims as our structures reach higher and higher into the air; strange diseases lurk in the chemicals which must be handled in so many of our industries. One of the most important spaces at the Museum has been devoted to showing the unseen perils to which the public as well as the workers are exposed, dangers which are disclosed only after an examination by expert inspectors. For example, in connection with elevators, the exhibit will show supporting wheels, shafts nearly cut through by a set screw, journal boxes of an elevator machine where the broken bolts allowed the mechanism to run away without control; cables, chains and links that were just on the point of breaking; boiler plates and pipes after the explosion; the correct and faulty mount-

ing of valves on boilers; boilers with and without water glasses, etc. This department has been given the graphic name of "chamber of horrors."

Since a very large percentage of accidents may be prevented, a gold medal is offered for the best device for the protection of life and limb during the year, the field for this award, during 1908, being limited to transportation. All devices, however, that are practical and meritorious, will be exhibited in the museum, which is open to the public free every day. The exposition will display, as far as possible, "live" exhibits—that is, machines or devices in operation, models of actual or reduced size, and photographs. All inventors of safety devices of any nature, from simple means for turning off the gas so as to prevent its escape, to block signal systems for railways, are invited to send models. The advantages of such an exhibit are too obvious to note. Expert demonstrators will be employed to explain the various models to the general public, and the Museum will thus become a sort of branch showroom for the products, which will, it may be confidently assumed, come under the eyes of those interested in these lines of industry. The fact that an article is on exhibit there is a guarantee of its practicability, as no device will be accepted until after it has been approved by the jury of admission. On the whole, the Museum promises not only to stimulate the need for the wider use of safety apparatus, but to offer a valuable opportunity to inventors of such devices.

Corrugated Steel Piling.

Engineers have been experimenting to originate a steel pile section or shape which would give the utmost strength with the minimum weight of metal. The result of these experiments is a corrugated steel sheet piling, which is manufactured from standard steel plates, corrugated and provided with a central clip, that locks the adjoining sections of the piling when in position. Being made from plates, this steel piling can be supplied in an almost unlimited range of sizes and weights, and is therefore adapted to the greatest possible variety of conditions.

There is perhaps no other shape of metal which, for equal weight, will have the stiffness of a corrugated section, and this is the fact which gives the corrugated steel piling its remarkable stiffness and penetrating power. Many failures have been due to lack of stiffness in steel pilings, and this is a decided advantage.

The corrugated section, on account of its configuration, presents an ideal surface for the driving, and it is easier to drive it straight because it is quite symmetrical. All the driving is done on the corrugated plate, as the clip is cut back from each end, and therefore all strain on the rivets is eliminated. Furthermore, the binding which results from the inevitable crimps in rolled sections, and requires an exceedingly heavy hammer for driving, is practically absent in the corrugated sections. The latter are formed from cold plates, and therefore are more nearly straight and uniform than the sections finished hot.

The Metal Momel.

A new metal called momel, which is expected to cause something of a stir in the industrial world, is being produced at the works of the Canadian Copper Co., at Sudbury, Ontario. It consists of a compound of copper, nickel, iron and one or two other minerals which are found in the district, and its importance lies in the fact that it is much less costly than nickel, is less liable to rust, and will serve all the purposes that are served by that metal in the industrial world.

The new metal is said to be of equal ductile strength with nickel, and to possess all its other essential qualities; but it is not claimed that it would serve the purpose of nickel steel, which is used as armor plate.

New Process of Smelting Iron.

A method of producing iron and steel from ore direct, without reduction to pig iron, is reported by our Consul at Sydney, Australia. It is claimed that wrought iron and steel, of the best quality, can be produced by the new process, and the working cost is less than by the old method, as less machinery and less labor are needed. By treating pure granulated iron ore separated from the gangue magnetically, the high cost of melting and fluxing the gangue is saved, viz., cost of fluxes, fuel, time and capacity of plant. Iron sand is now being treated by the works, but it is said that the process is effective in treating any ferruginous ore, provided the same is first pulverized—an operation which can be readily done by mechanical means at small cost. The possibilities before this new process, which has such advantages over the old one, can hardly be realized.

A Lightning Arrester.

To stop lightning by electricity is like fighting the devil with fire: and—if we take the opinions of those who claim experience in this line of warfare—it is quite as successful as the latter operation. The most recent development in devices designed to protect electrical apparatus from over-voltage, due to lightning or other sources of disturbance, is the electrolytic or aluminum cell arrester. It has long been known that an electrolytic cell, made of two plates, one aluminum and the other carbon, possessed the characteristic of letting the current flow freely in one direction, but not in the other. It occured to scientists to make both plates of aluminum, thus forming a device with an action analogous to that of the safety valve on a steam boiler, since little or no current would pass so long as the electrical pressure was low. With a high pressure, a large current begins, which ceases as soon as the pressure resumes its original force.

Such a characteristic is ideal for protecting electric circuits against over-voltage and its attendant dangers. The plates in the arrester are arranged in tray form, so that one rests within another, insulated from each other but all containing an electrolyte. The whole is enclosed in a stoneware jar, and if desired, one jar may be placed upon another, so as to increase the strength of the arrester. Arranged in this way, the electrolytic lightning arrester has all of the qualities of a safety valve as applied to electric circuits.

Wood Bending.

Wood does not safely stretch a particle; if it does, it breaks. The bending of wood therefore, as illustrated in chairs, baskets, etc., is based on, and consists of, compression. When wood is bent, the difference in the length on the inside and the outside must be made up for by compression.

Any wood may be bent to a certain extent, but some bend more easily than others. Hickory bends well, but not nearly as readily as it would if it were not so hard and difficult to compress. Elm, which is softer, is one of the best woods known for bending purposes. Ash and oak also figure largely in bent work.

Some woods can be easily bent by simply soaking them in water; but moisture and heat together make the best combination for this purpose. It does not hurt wood, and it is really good for it to be immersed in water and the latter brought to the boiling point. Another method is to put the stock in a vat and turn wet steam on it. The bending part of the work involves more complications than the boiling, and many points must be guarded with care. The outside of the bend must be watched closely, so that it may not give way through sudden strain on one point. The stock, also, must be bent quickly when it is hot, as it bends better then than when it gets cool.

Hardening Steel by Electricity.

Le Genie Civil contains a description of a new methed for hardening steel by electricity. The tool to be hardened is put in electric connection with the positive pole of the battery. In similar connection with the negative pole is a cast iron tank, full of carbonate of potash dissolved in water. The tool is plunged to the desired depth in the solution, just as for hardening in the usual manner: the current is switched on and the tool heated to the proper temperature. The current is then turned off and the tool is left in the bath, which latter, by the simple act of switching off the current, is at once converted into a hardening bath.

Another method, which permits of hardening places on the surface of pieces, where the dipping process would not accomplish the desired object, is local heating with the electric arc. Here the tool or other article is laid on a copper block, and an ordinary arc carbon held in a safety holder; the electric connections with holder and block being made, the carbon pole is touched to the piece to be locally hardened. Of course the heating is both intense and local; the piece is at once plunged into the ordinary hardening bath, and when one place is hardened, the next is heated, and so on.

The electric current may also be used to draw the temper of a hollow object. Instead of using a red hot iron rod to plunge in the bore, a cold rod is employed which is used as a resistance in the circuit of a secondary current of about two volts tension. The temperature of the iron rod gradually rises, and when the piece has reached the desired color, the current is shut off. This method is said to produce less liability to crack than the old fashioned way of drawing the temper with a hot rod.

Rust Proof.

A process for making iron and steel rust proof has been tried in England, and is about to be introduced in this country. It is claimed that it coats iron and steel with zinc as well as or better than ordinary wet galvanizing, and that the metal thus coated can be brilliantly polished. In the process, zinc dust is placed in a cylinder which has been brought to a temperature of 400° or 500° F: that is, below the melting point of zinc. The articles it is desired to treat are put into the cylinder, which is then revolved. The zinc is not actually melted, but forms an alloy through the surface of the articles absorbing the zinc, and then a coating covering the whole visible surface is deposited to any desirable thickness. Articles thus treated are said to have an even and adherent coating which wears excellently and does not strip, and are easily polished by a mop. It had been found that the use of the wet galvanizing process upon articles on which threads are cut made it necessary afterwards to recut the threads. This, it is claimed, is obviated in the new process, which not only avoids the additional work of recutting the threads, but makes the threads themselves rust proof. Another advantage claimed is that because articles are not heated to a high temperature, the temper of the steel is little affected, while its tensile strength and that of iron remains the same. The owners of the process assert that it will obviate the necessity of using brass in the manufacture of many articles that may rust, an important development in view of the high cost of brass. Aluminum and antimony may be substituted, it is said, for zinc, while when copper and its alloys are subjected to this process, their surface is so hardened as to turn the edge of even a steel tool.

New Use for Liquid Air.

One of the most valuable applications of liquid air has been in the study of certain materials at low temperatures. It is generally assumed that at very low temperatures metals become brittle, the breaking of steel rails in winter being attributed to this cause. By the use of a bath of liquid air it has been found practicable to test various metals, and this has led to the discovery that while many steels have their tensile strength increased, their ductility lowered and their brittleness raised by low temperatures, this is not always the case. A British metallurgist has shown that a nickel manganese steel can be made which will be as tough at that temperature as in ordinary atmospheric conditions, and this without material change in the tensile strength.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies $1.50.—Please give correct data in ordering.—Address,

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Hinge for Morris chairs, &c.....C. L. Greilick
Hook and eye holder.....F. M. Dolezal
Horn-fish.....D. Heyman
Horseshoe-creaser.....J. C. Locke
Hydrocarbon-engine, Two-cycle, 2 pats.....D. L. Oulton
Incubator.....F. T. Porter
Incubator.....C. Dahl
Incubator-heater.....W. A. Sumner. (Reissue.)
Incubator heating apparatus.....J. L. Nix
Ink-fountain.....C. R. Taylor
Insulator for heavy conductors..L. Steinberger
Internal-combustion engine..A. H. Goldingham
Internal-combustion engine.....H. W. Adams
Internal-combustion engine.....P. Daniel
Jar-support.....A. M. Katzenbach
Jewelry-stand.....M. Engelsman
Journal-box, Railway-car.....H. J. Klinsman
Kaleidoscope.....J. R. Hare
Keg-cover.....H. Dittmann
Kneading machine, Butter.....A. Fischer
Lacing-loop.....C. A. Heim
Ladder, Step-.....J. R. Rupe et al
Lamp, Alcohol-.....A. Rector
Lamp-font and match-holding device, Combined.....J. Myers
Lamp shade, Incandescent-.....E. B. Lewis
Lamps, Combined base-frame and bracket for signal-.....A. H. Handlan, Jr.
Last, Repair-.....D. Rounds et al
Lasts, Support for use in finishing, C. Benscheidt
Lathe-dog.....G. J. Blum
Letter-box.....P. J. Schiffer
Letter-clasp.....A. J. Kriete
Liner-plate.....B. A. O. Prollius
Liquid-dispensing vessel.....L. G. Langstaff
Loading-apparatus fork.....W. Baker
Lock.....T. M. Lansden
Locomotive brake-shoe.....H. H. Urqubart
Locomotives, By-pass valve for, J. E. Eague et al
Loom, Narrow-ware.....C. H. Maxsted
Mail-bag catcher and delivcrer.....E. Roberts
Maize or Indian corn, Degerming....J. F. Gent
Match-safe.....W. F. Smith
Mattress.....H. C. Innes
Mattress.....W. F. Wyman
Mattress, Spring-.....H. M. Brock
Measuring-tools, Micrometer attachment for.....G. Koffskey
Miner's shovel.....D. B. Lewis
Mining-machine, Pneumatic.....W. R. Butts
Miter-box.....J. Knudson
Mitt or glove, Catcher's..E. J. and H. Goldsmith
Moistener.....J. P. Gilman
Molding-machine.....C. E. Lambertson
Molding machine, Sand-.....A. P. Smith
Mop head and wringer, Combined.....J. W. Lappin
Mop-wringer.....D. Whitehurst
Motion, Twine-take-up.....C. E. Kelly
Motor-controller regulator, Electric-.....P. A. Weyand. (Reissue.)
Mounting.....L. F. Adt
Mowing-machine attachment.....F. S. Laflin
Muffler.....W. L. Gee
Muffler for explosive-engines.....H. S. Powell
Musical instrument, Mechanically-operated.....E. H. Klaber
Musical instruments, Pianissimo device for.....I. B. Smith
Needle.....R. B. Bach
Numbering or marking machine.....G. H. Lang
Nut-lock.....S. Benson
Oils, Refining, fractionating, and reducing.....W. C. and F. E. Wells
Outlet-box.....H. Becker
Outlet-box, Electric-installation..W. H. Vibber
Packing, Piston-rod.....F. Duffy
Padlock.....F. G. Snook
Pail-supporting device.....A. R. Pritchard
Pail-supporting device, Paint-....P. Richardson
Paper-making machine.....J. A. Dupont
Paper or cardboard box.....W. R. Comings
Paper-roll.....M. Church
Paper, Roll toilet-.....G. C. Mather
Paper-sack holder.....I. J. Simmons
Peeler, Potato-.....C. H. Clark
Pencils, penholders, or the like, Assortment-box or display-rack for lead-.....J. S. Kenny
Perforating-machine.....J. C. Barclay
Perforator.....J. C. Barclay
Permutation-lock.....W. B. Turman
Petticoat.....L. Sittig
Phonograph disk records, Cabinet for holding..X. Cukier
Phonography.....I. Kitsee
Pianissimo device or expression-governor.....I. B. Smith
Piano, Automatic.....S. J. Laughlin
Piano-case.....I. M. Field
Piling, Interlocking sheet-.....G. E. Nye
Pipe and gas connection.....H. E. Loebe
Pipe-coupling and valve.....F. R. Kirchhoff
Planter, Corn-.....C. Anderson
Planter, Corn-.....W. A. Tuttle
Pneumatic drill.....J. W. Smith
Pneumatic wheel and hub.....H. A. Brown
Polarity-changing switch, Series-parallel.....E. S. Lincoln
Postmarking and canceling machine.....W. B. Martindale
Pollen-collecting device.....E. Moulié
Power-converting device, Windmill-.....W. R. Beers
Printing tapestry, Machine for.....C. F. M. Kroenert
Pulp articles, Apparatus for molding.....W. A. Lorenz
Pump.....L. K. Doelling
Pump.....O. M. Patterson
Pump, Balanced.....D. M. McLaughlin
Pump, Centrifugal.....E. W. Brooks
Pump, Compound-piston centrifugal.....E. W. Brooks
Pump regulator, Hydraulic-.....E. Griswold
Pyrimidin derivative.....L. Weber. (Reissue.)
Radiator.....J. A. Lidvall
Rail-joint, Insulated compromise.....B. Wolhaupter
Railway-joint.....B. U. Annas
Railway screw-spikes, Machine for driving.....D. P. Sheehan
Railway-switch.....J. B. Mays
Railway-tie, Metal.....J. M. Hunnel
Railway-track brace.....A. J. Coover
Receptacle.....C. Uhden
Refrigerator.....G. Frank
Registering apparatus.....N. J. Barnd
Registering mechanism.....J. Schinneller
Roofing, Sheet-metal.....J. F. Galbraith
Rotary engine.....C. R. Reid
Rotary engine.....A. Mercer
Rotary engine.....E. Srnec
Rotary screen.....G. F. Smailes
Routing-machine.....G. L. Kelley
Running-gear.....A. F. Clark
Salts, Electrolyzing.....J. Whiting
Sample-holder.....J. F. Sadler
Sash-fastener.....W. W. Klima
Sash-fastener.....B. B. Turner
Saw, Planing-.....C. E. Rider
Sawmill set-works.....N. E. Rice
Scale.....W. G. Templeton
Seal, Box-.....G. F. Edgington
Seaming-machine.....O. S. Beyer
Seed-feed device.....W. G. Bolus
Sensitive sheets, Device for successively exposing.....C. P. Goerz
Serving-table.....H. Vogler
Sewage-ejector.....W. McClintock
Sewage-treating apparatus.....A. I. Joseph
Sewing-machine.....H. A. Klemm
Sewing-machine attachment.....A. Eiben et al
Sewing machine, Shoe-.....C. L. Eaton
Sewing-machine tuck-marking attachment.....W. M. Ammerman
Sewing-machines, Welt and thread cutting means for.....T. G. Plant
Sewing-machines, Welt-measuring means for.....T. G. Plant
Shackle, Animal-.....J. Jones
Shade and curtain fixture.....E. E. Palmer
Shearing-machine.....C. M. Palmer
Shears.....O. Witt
Shears for cutting iron.....W. A. Gahler
Shipping-can.....J. B. Whitehead
Shoe.....C. R. Sebleifer
Shoemaker's gage.....F. L. Richardson
Shoulder-brace.....G. T. Foltz
Shovel and brush, Combined....T. J. Thompson
Shredding-machine, 2 pats.....M. F. Williams
Sink or tub, Folding.....A. Hines et al
Skid and truck.....G. G. Connor
Skidding, Protector against.....C. Henke
Slasher.....A. E. Rhoades
Slimes-filter apparatus.....E. M. Clark
Soldering compound.....O. C. Hoover
Spacing-tool.....C. McKenzie
Spark-coil.....A. R. Luscbka
Speed mechanism, Variable-.....T. C. Dill
Speed-meter.....R. Johnson
Speeds, distances covered, and the like, Instrument for indicating.....E. V. Gratze
Sprinkler fender, Lawn-.....W. Linhoff
Sprinkler-head, Automatic.....E. M. Cook
Sprinkler system, Automatic.....J. Fiddes et al
Spur, Riding-.....D. W. Crowder
Stack construction, Form for.....F. Head
Stamping and grinding mill.....T. M. Topp
Steam-boiler.....W. H. Shafer
Stereotype-plates, Apparatus for finishing.....C. E. Hopkins
Sterilizing food or organic compounds.....C. C. L. G. Budde
Still.....L. V. Sone
Still.....L. V. Sone
Stone blocks, Apparatus for molding artificial-..J. W. Sbone et al
Storage battery.....W. Gardiner
Storm-hood.....J. Archdeacon
Suspenders.....W. R. Oppenheimer
Switch-lock.....I. T. Tullock
Switch-stand.....F. G. Snook
Tack and nail lifter, 2 pats.....R. R. Smith
Tack and nail puller.....R. R. Smith
Talking-machine-disk protector.....J. M. Higley
Target, Drop-.....J. A. Wiborgh
Telegraph, Printing.....J. C. Barclay
Telegraph-switch.....L. H. Parcels
Telegraphy.....P. B. Delany
Telephone-exchange.....N. E. Norstrom
Templet.....H. B. Ash
Tire antislipping device.....W. T. Maxwell
Tire-inflator, Portable.....J. W. Radu
Tire, Spring-.....T. J. McCarthy
Tobacco-pipe.....S. E. West
Tobacco-pipe.....M. Jeantet
Tobacco, Treatment of, 2 pats.....A. C. and G. O. Bedortha
Tobacco-wrapper receptacle....E. C. Brockmann
Tower, Skeleton.....L. W. Noyes
Trace, Harness-.....C. Van Denbark
Track-sanding device.....J. W. Brady
Transmission mechanism.....O. S. Beyer
Trap.....H. H. May
Trolley.....A. W. Huhsman
Trolley-car clencher.....E. O. Marsh
Trolley-wheel, Self-lubricating.....H. G. Farr
Trolley-wheels, Wire-retrieving attachments for.....W. C. Althen

Trucks, Spring-plank seat for car-.....G. G. Floyd
Tubes, Device for holding, alining, and punching metal.....W. B. Murray
Tunneling in rock.....J. P. Keane
Turbine-engine.....L. Hachenberg
Turbine, Fluid-pressure.....B. E. Lewis
Turbine, Steam-.....E. C. Terry
Type-writer attachment.....H. A. Kirby
Type-writing machine.....O. Woodward
Type-writing machine.....H. H. Steele
Umbrellas and the like, Device for supporting.....A. E. Shuster
Valve.....A. C. Ricksecker, Jr.
Valve, Bottle-.....V. P. McVoy
Valve, Dry-pipe.....E. M. Cook
Vaporizer.....G. H. Gerber et al
Varnish and producing same..A. P. Bjerregaard
Vegetable-topping machine.....W. R. Shufelt
Vegetation-destroyer.....W. R. McKeen, Jr.
Vehicle.....C. E. Thorp
Vehicle driving-gear, Motor-road-.....P. G. Tacchi
Vehicle-gear.....J. C. Bashford
Vehicle, Motor-.....W. G. Windham
Vehicle operating device, Motor-.....P. A. Darracq
Vehicle-rim.....W. J. Nordlund
Vehicles, Combined power-transmission and automatic braking mechanism for motor-driven..T. W. Heermans
Vehicles, Combined whip, rein, and laprobe lock for.....O. W. Wilde
Ventilator.....A. H. Mix
Vessel-hull scraper.....W. E. Scott
Vibrator.....A. R. Luschka
Vise.....G. P. Blackiston
Vise, Bench-.....J. G. Baker
Wagon-bed attachment.....S. B. Wenger
Wagon Dump-.....W. L. Collins
Walking-beam truss-rod.....E. W. Cokely. (Reissue.)
Washing-machine.....J. M. Hatfield et al
Washing-machine .....J. F., J. S., Jr., and A. L. Bennington
Water-closet.....J. A. McAvity
Water-motor.....J. Dietz
Wheel.....C. B. Van Horn
Wind-instrument mouthpiece.....T. Martens
Windmill-gearing.....H. E. Brown
Wire ends, Machinery for connecting.....J. W. Tower
Wooden structure and constructing the same, Staved.....D. E. Vanvactor
Work-holder.....M. P. H. Schroeder
Wrench.....T. Larson
Wrench.....J. E. Claunch
Wrench.....A. Schaller
Wrench.....A. E. Deason
Wrench.....J. C. Holm

DESIGNS.

Badge.....L. Caldwell
Bracelet.....S. Mitchell
Brooch or similar article.....J. M. Rossi
Casket.....H. J. Rademacher
Coat, Woman's.....N. Reisman
Electric-heater casing.....F. C. Green
Glass, Drinking-.....L. Bessiére
Plate or similar article.....G. A. Alexander
Rug.....A. Petzold
Spoons, forks, or similar articles, Handle for.....G. C. Lunt
Vehicle-body.....H. P. Maxim

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MECHANICAL PATENTS.

Acetylene-generators, Carbid-feed for.....A. S. Phelps, Jr.
Addressing-machine.....M. and J. Burke
Adjustable bracket.....L. D. Carter
Advertising apparatus.....C. A. and C. E. Yale
Advertising device.....A. B. Mackie
Air-brake.....W. G. Pattee
Air-compressor, Electric.....N. M. Watson
Amusement device.....F. J. Johnston
Animal-trap.....T. J. Crump
Annealing furnace, Wire-.....H. B. Humphrey
Annular knife.....E. G. Hoffmann
Apparel, Wearing-.....J. A. Sullivan
Arch-supporter.....C. E. Bullard
Assembling apparatus.....J. R. Brown
Automobile driving-gear.....J. E. Johnson
Automobile running-gear.....C. T. Pratt
Automobile transmission-gear.....J. W. Lambert
Awning, Porch-.....C. Frantz
Bag-holder.....Z. R. Brown
Baler, Hay-.....R. E. Zimmerman
Baling device.....G. N. Campbell
Baling machine, Broom-corn-.....C. K. Miller
Baling-press indicator.....C. A. Whitehorn
Barber's check system.....C. L. Derr
Barley, Preparing.....J. A. Caverhill
Bearings, Automatic lubricator for shaft-.....J. R. Steiger
Bed, Invalid or hoisting.....J. J. Collins
Beet-topper.....C. L. Winterburn
Bellows, Hand-.....J. H. Fecker et al
Binder, Loose-leaf.....A. Dom
Binder, Temporary.....H. F. Bushong
Biscuit, Machine for manufacturing cereal.....H. D. Perky
Bit-stock.....I. Larson
Boards, Manufacture of cellular.....S. M. Langston
Boats, Feathering paddle attachment for small..W. Rickards
Boiler-tube.....W. A. Compton
Boiler-tube cleaner.....R. O. Hodge
Bolt.....M. Jacobs
Bolt for desks and other structures.....C. E. Johnson
Book, Account, 2 pats.....W. T. MacDougall
Boring-bar.....C. L. Riker, Jr.
Bottle holder, Ink-.....W. S. Paulson
Bottle-stopper.....J. S. Alston
Bottle stopper, Water-.....H. P. Kraft et al
Brace.....G. M. D. Heard
Brake-applying mechanism.....J. M. Hines
Brew-house equipment.....M. Henius
Brooms and the like, Holder for.....W. Jones
Brush.....H. V. Hardman
Brush-holder.....R. Fehler
Brush, Tooth-.....W. N. Taylor
Brush, Tooth-.....L. H. Crowell
Brushes and brooms, Manufacture of.....P. Chazal
Brushes, Manufacture of.....P. Chazal
Brushes, scrubbers, and the like, Device for fastening the handles in.....A. Eisel
Buckle.....J. S. Sourek
Buckle.....E. N. Humphrey
Buckle for webbing.....F. A. and J. B. Russ
Buckle, Harness-.....I. Sellers
Button.....T. J. McGovern
Cabinet.....S. D. Newman
Cable or rope.....G. Magaldi
Calculating-machine.....A. M. Johanson et al
Calculating-machine.....A. Müller
Camera, Photographic.....L. M. Sternbergh
Can-opener.....G. K. Winchenbach
Can-spout.....W. McAdoo
Cans, casks, &c., Carrier for.....J. Cummings
Car.....E. A. Barber
Car.....E. S. Bucknam
Car door, Grain-.....M. Reid
Car friction draft-gear, Railway.....A. Stucki
Car-heating system.....E. E. Gold
Car-motor mounting Street-.....E. A. Barber
Car-mover.....V. Gusztáv
Car-rack.....J. B. Foley
Car-replacer.....H. E. and W. P. Matthews
Car, Single-truck.....E. A. Barber
Car-stake.....F. W. Lawrence
Cars, Portable automatic stop mechanism for.....P. Winsor
Carbureter.....L. M. J. C. Levavasseur
Carbureter for internal-combustion engines.....O. Minton
Carbureters, Cushioning device for automatic dilution-valves in.....A. A. Longuemare
Card shuffler and trump-indicator, Playing-.....J. Gaunt
Carding-machine cylinder and clothing therefor.....C. A. Cobbett
Carpet-sweeper.....T. L. Totten
Cart, Dumping-.....B. F. Brown
Cartridge.....G. A. Finster
Cashier and discount machine, Automatic.....C. E. Yale
Casing-head.....D. K. Johnston
Cast-iron and the like, Hardening of.....G. H. H. Emett
Caster.....W. B. Rand
Casting-machine.....A. L. Walker
Cement compound, Composition of matter to be used as a.....C. Guy
Cement-mixing machine.....F. J. Emal
Centrifugal machine.....L. Fuchs
Chain and bead stock, Jeweller's.....J. Costello
Chain, Door-.....J. Kleidmann
Chair.....J. E. Baker
Chairs, Mirror attachment for..C. I. Thompson
Check-protector.....N. B. Rice
Check-protector.....D. H. Cohen
Churn, Aerating-.....E. H. Burnes
Chute, Grain-.....A. G. Young
Cigar-clipper.....M. Bixby
Cigar tip-cutter and lighter, Combined.....T. P. Moody
Clarinet.....H. Bonn, Jr.
Cleaning apparatus, Suction.....E. K. A. Baumann et al
Clock, Alarm-.....E. E. Stockton et al
Clock, Alarm-.....E. E. Gagé
Clock and watch.....J. Lichtenstein
Clothes-drying reel.....W. J. Coulter
Clothes-line prop, 2 pats.....D. McDougall
Clothes-line reel.....L. Holle
Clothes-line support.....H. Morris
Clothes-pounder.....H. L. Crooker
Clutch.....O. Anderson
Cocks, Self-locking attachment for angle-.....W. C. Feighan
Coffee or tea percolator.....F. Geissler
Coffee or tea pot.....I. J. Webster
Coil-windings, Reel for.....I. De Kaiser
Coin-controlled apparatus, Percentage mechanism for.....C. E. Yale
Coin-receptacle.....E. W. Roberts
Collar-supporter.....A. Illoway
Commutator-cover.....J. E. Webster
Computing-machine....A. S. Dennis. (Reissue.)
Concentrator.....J. E. Doggwyler
Concrete-building-block wall, 2 pats.....F. M. Henry
Concrete walls and the like, Means for use in building.....R. W. Pommerer
Conveyer.....F. R. Willson, Jr.
Conveyer, Cable-hoist.....B. C. Riblet
Cop-making apparatus...J. Schärer-Nussbaumer
Cop-tube.....S. W. Wardwell
Corn-husker.....J. W. Ertz
Corn-shellers, Cob-gate for.....A. H. and H. A. Berns
Corn tree, Seed-.....J. C. Blackford
Corset.....M. Bachuru
Corset.....J. Cohen
Corset.....E. Abadie-Leotard
Cot and pack-sack, Convertible.....C. F. Forsell et al
Cotton-chopper.....S. W. Jackson
Cotton-chopper.....G. B. Gauntt
Cotton-gin feed attachment.....C. B. P. Carver
Cotton-scrape.....C. R. Bowen, Jr.
Counter-protecting device for stores, &c.....J. B. Monette
Coupling-head, Steam.....B. F. Hudson
Culinary boiler or steamer.....A. B. Rice
Culm, Sectional.....J. S. Wilson
Cultivator.....C. W. Gibbs
Cultivator, Power-.....C. Edwards
Curd-mill.....J. Brouwers
Currycomb.....R. N. Tunstall et al
Curtain-bracket and shade-roller support.....F. Adams
Curtain-fixture.....H. K. Meis
Cutlery-washing machine.....W. E. Merrell
Dam, Shell-.....E. B. Jennings
Dish-drainer.....G. Samsó
Displaying articles of merchandise, Means for...W. O'Sullivan
Door check and lock, Safety....V. Francek et al
Door-covering, Metallic.....E. B. Gager
Door, Grain-.....W. S. Driskell
Door-hanger.....P. F. Holsters
Doors, walls, and the like, Spying-aperture for..J. Shackley
Draft-equalizer.....J. Van Matre
Driving mechanism, Friction-clutch.....J. A. Firsching
Drying fabrics or fibrous material, Apparatus for.....A. N. Marr
Dust-collecting apparatus.....G. R. Bimm
Dust-collector.....W. A. Derby
Dyeing and other machines, Hoisting apparatus for.....J. Hussong
Dyeing bobbins and the like, Machine for.....C. Wansleben
Electric alarm operated by alarm-clocks.....E. Ploudre
Electric-car lighting, Means for mounting and driving dynamos for.....A. McGary et al
Electric charges, Conductor for discharging high-voltage.....W. H. Chapman
Electric contact, Overnead.....T. W. Small
Electric machine, Dynamo-.....E. M. Tingley
Electric supervisory and signaling system, Automatic.....J. G. Nolen
Electrical contact device.....F. Fink
Electricity, Neutralizing static.....W. H. Chapman
Electrolytic apparatus for electrolysis of metallic salts.....W. H. Rines
Embroidered web, Appliance for severing.....A. Bosshard
Engine.....J. Copeland
Engine attachment, Hoisting-.....H. Maker
Engine casing or frame, Gas-..I. P. Miller et al
Engines, Electric sparking device for gas-.....E. R. Moffitt
Engines, Lubricant-distributer for....V. Lancia
Envelop and letter sheet, Combined.....W. A. Pridmore
Evener.....T. Kreutz
Excavator.....H. Greer, Jr., et al
Explosion-engine.....C. L. Edwards
Extension-table.....F. J. Seng
Eyeglass nose-guard.....D. F. Green
Feed-bag, Foldable.....T. Clish
Feed-trough.....L. Z. Pearson
File and punch, Paper.....C. Spiro
Filling-tube for liquids, 2 pats.....A. Schneider
Filling-tube for liquids, Sealing-head for.....A. Schneider
Finish remover.....P. J. Ryan
Fire-extinguisher.....J. L. Hyde et al
Fireplace-screen.....C. E. Mitchell
Fireproof building construction, 2 pats.....C. Collins
Fireproof shutter.....J. Cahill
Fish-line float.....J. S. Denning
Fish scaling and cleaning machine.....G. P. Yeakel
Flag-signal and case, Locomotive.....J. P. Lyon
Floor-finishing apparatus.....N. D. S. K. Beck
Fluid-pressure brake system.....G. M. Spencer
Flush-tank.....O. J. Fabian. (Reissue.)
Fly-catcher.....H. A. Kessler
Fly-catcher.....F. Bayer
Folder and mailing-case therefor, View-.....M. Witt
Fraud detecting and preventing means and method.....E. A. Evans
Friction-coupling, Cone..H. Baumgartener-Mica
Fuel-manufacturing apparatus.....P. Hoering
Furnace-grate.....H. Sieben et al
Furnaces, Reversing-valve for regenerative.....J. B. Nau
Fuse, Electric.....S. J. Leveen
Gage and circuit-closer, Combined..J. F. Raynes
Gage for carpenters' rules, &c.....R. R. Lea
Game apparatus.....J. L. E. Pell et al
Game apparatus.....S. D. Bowers
Garment, Combination-.....M. E. Rogers
Garment-supporter.....M. Hirsch
Garter.....B. E. Paneth
Gas-burners, Globe-holder for...W. Livingstone
Gas-generators, Apparatus for feeding fuel to...C. F. Cattell
Gas-pressure-regulating device.....T. B. Keogh
Gases, Apparatus and process for burning acetylene or similar.....J. Harris
Gate.....W. S. Flick
Gear, Reversing-.....F. G. Gies
Glass pressing and blowing machine.....A. W. Beeson
Glassware, Apparatus for fire-finishing, R. Haley
Gold-leaf and the like, Apparatus for applying ribbon.....G. Bräunlein
Golf-ball.....W. Taylor
Governor.....W. H. Glocker et al
Governor and valve movement.....G. Wolke
Grader and excavator.....W. F. Fink
Grain drying and cooling machine.....S. J. McCarthy
Grain tank and elevator.....J. W. Toblin
Grinding machine, Shear-.....G. Wieber
Guard device.....A. S. Josephs
Gun carriage, Field-.....A. T. Dawson et al
Hacksaw.....W. M. Stebbins
Hair-dyer.....L. Stafford
Hair-pin attachment.....C. Hartman
Hair-spring gage, Watchmaker's.....E. Clark
Harness-hook.....H. Greenland
Harness, Shoeing-.....W. M. Clement
Harvester, Corn-.....R. B. Brewer
Harvester, Flax-.....J. H. Philipp
Harvester, Potato-.....F. W. Heimberger
Hasp-lock.....G. F. Darracott
Hat, Lady's and child's.....K. E. Mann
Heat transference.....C. R. Butler
Heaters, Apparatus for cleaning water-.....G. J. Dehn
Heating and ventilating system.....W. R. Macdonald
Hoe, Surface-.....J. A. Crummer
Hoist.....E. Y. Moore
Hoisting and conveying device..T. S. Miller et al
Hoisting apparatus.....A. P. Boyer
Hook and eye.....W. H. Knobloch et al
Horse-releaser.....B. L. Sinclair et al
Horse-releaser.....A. White
Horseshoe.....J. P. Detwiler
Horseshoeing-stall.....L. Pendleton
Hose-supporter clasp.....J. Cohen
Hot-air register.....S. Tuttle
Hot-water heater....J. A. and E. W. Coppridge
Hub-attaching device.....S. Gnagy
Hub-banding machine.....O. A. Frick
Hydrocarbon-burner, 2 pats.....S. W. Bates
Ice-creeper.....A. B. Johnson
Ice-harvesting machine.....T. Diamond
Ice-machine compressor.....C. W. Miles
Induction-coil.....R. Varley
Induction-coil system.....I. C. Orswell
Inhaler.....A. F. Meisselbach
Ink-well.....A. Gailey
Inking-pad.....D. T. O'Sullivan
Insole.....N. C. Bohr
Insulator.....H. R. Markel
Irrigator, Electrolytic.....P. [illegible]
Joint device, Expansion-.....[illegible]
Journal-bearing.....[illegible]
Journal-box, Car-axle.....[illegible]
Journal-box for road and other [illegible].....[illegible]
Key.....[illegible]
Key-ring device.....[illegible]
Keyboard.....[illegible]
Knee-rest.....[illegible]
Lace and tongue-tag, Shoe-.....[illegible]
Ladder, Collapsible.....[illegible]
Ladle-carrier.....[illegible]
Lamp.....[illegible]
Lamp-burner.....[illegible]
Lamp, Gas-, 2 pats.....[illegible]
Lamps, Manufacturing incandescent [illegible] electric.....[illegible]
Lantern, Hand signaling-.....[illegible]
Last.....[illegible]
Lathes, Model or guide wheel for..[illegible]
Leather, Manufactured.....[illegible]
Light-box.....[illegible]
Lithographic stone, Cemented.....H. Wagner
Load-binder.....T. Barnes
Lock and sealing device.....G. H. Maas
Loom for weaving tufted fabrics.....J. A. Clark
Loom shuttle-motion.....M. Moul
Loom, Weft-replenishing.....W. H. Brother
Magnet for alternating currents.....C. Krämer
Mail-bag catching and delivering apparatus.....J. C. Dayton
Mail-box.....N. Saltonstall
Mail-box signal.....T. G. Brown
Maps in colors and in relief, Manufacture of.....A. Patesson
Marking device.....F. J. Kadan
Massage apparatus, Vibratory...G. R. Macomber
Match-box, Magazine-feed.....L. Hamill
Mausoleum, &c., Non-condensing and storm-proof.....T. J. Moore
Measuring and gaging tool.....A. Wagniere
Measuring device, Skirt-.....M. C. Hammond
Mechanical movement.....E. G. Eberhardt
Metal-hardening apparatus.....L. E. Curtis
Metal-turning mechanism.....J. Hartness
Milker, Cow-.....J. M. Mattis
Milkers, Self-adjusting belt for cow-.....F. B. Groff
Mining.....J. Kirschniok
Mirror attachment.....T. E. Sutton
Molding-machine.....F. Herbert
Molding-machine, Sand-.....J. J. Chipchase
Mop and brush making machine.....E. Koella
Motor.....F. C. Axtell
Music-box.....E. P. Riessner
Musical instrument, Mechanical.....J. McTammany et al
Musical instrument, Stringed.....P. Johnson
Nut-lock.....W. Chesterman
Nut-lock.....F. M. Volk
Nut-lock.....I. Barker
Nut-lock and antirattler, Combined..J. W. Koch
Oils and the like, Apparatus for the chemical purification of.....J. Fischer
Oven, Draw-plate baking-.....F. H. Van Houten
Oxids, Reduction of refractory....K. A. Kühne
Packing, Metallic.....G. D. Rollins
Packing, Piston-rod.....L. M. Byrnes et al
Pad for writing-machines, furniture, &c.....C. C. Chrisman
Padlock.....O. Katzenberger
Paper-bag holder.....F. Thomas
Pasteurizer.....J. C. Miller
Pattern-grading machine.....L. E. Coté
Penholder.....A. Jahn
Permutation-lock.....C. Smith
Phonograph.....E. L. Aiken
Phonograph-horn.....P. Weber
Phonographs, Feed mechanism for..W. A. Cook
Piano, Bell-.....J. Havassy
Piano or organ players, Valve for.....H. M. Smith
Piano, Upright.....J. J. Thomas
Pianos, Mute attachment for.....E. I. Pfeifer
Piling, (driving-point), Metallic sheet-.....G. W. Jackson
Pin and the like.....F. H. Noble
Pipe.....J. J. O'Toole
Pipe-wrench.....A. B. Heimann
Planing-machine.....J. R. Thomas
Plants of their fleshy substance, Machine for divesting parts of.....H. J. Boeken
Plate-holder.....J. T. McKean
Playing-ball.....C. T. and E. P. Kingzett
Pleasure-giving machine.....L. W. Whipple
Plow, Breaking-.....J. D. Arras
Plow, Motor-.....G. M. Shimp
Plow-point.....W. Titus
Pocket.....L. Hartel
Pole.....R. S. Orr
Polishing-machine.....R. T. Schuttler
Press.....I. Lichtig
Press-board.....K. E. Rogers
Printing mechanism, Time-.....H. Abbott
Printing-press, Platen.....M. Rockstroh
Propeller, Speed-controlling reversing-.....C. F. Roper
Propeller-wheel, Reversible.....C. Sintz
Pulley.....C. F. Foote
Pump.....J. A. Elliott
Pump.....M. J. Henry
Pump and well cub, Combined....W. A. Crumly
Pump, Centrifugal.....W. H. Thorne
Pumps, &c., Valve for.....E. E. Clark
Pumping-engine.....J. C. Smith
Purifier-box.....H. L. Doherty
Puzzle.....S. S. Cahill
Puzzle.....R. D. Martin
Pyrographic tool.....J. P. Müller
Racing track or course.....J. B. Georges
Radiator.....E. E. Deschane et al
Radiator-nipple-drawing device.....J. Deller
Rail chair and fastener.....J. A. Gossard
Railway draft-rigging.....C. J. Nash
Railway safety appliance..M. D. Breslauer et al
Railway-signal, Metallic.....J. H. Taylor
Railway signaling apparatus, Electric.....H. W. Spang
Railways, Alternating-current signaling apparatus for electric, 2 pats.....J. S. Holliday
Ram, Hydraulic.....L. Rubach
Ramie-decorticator.....H. J. Boeken
Range, Steam cooking-.....J. B. Barrett
Ratchet-brace.....G. M. D. Heard
Razor and stropping device, Safety-.....S. B. Battey
Receptacle stopper and brush.....B. G. Volger

Rectal supporter.....H. E. Cunningham
Rivet-extractor.....J. Butsch, Sr.
Riveting-machine.....T. S. Bennett
Rock-drill, Hand.....C. F. Paul, Jr.
Rock-drilling-machine support....C. F. Paul, Jr.
Rollers, Machine for pressing lines or designs into.....R. Laing
Rope-soeket.....R. A. Hammond
Rotary engine.....F. Süren
Rotary engine.....J. L. Adams
Rotary explosive-engine.....J. D. Long
Rotary motor.....H. Van Beresteyn
Rough-rounding and channeling machine.....F. L. Alley
Rough-rounding machine.....A. M. English
Roving and similar frames, Device for preventing singles in.....T. Bentley
Saddle-post.....C. Olson
Salts from solutions, Extracting.....H. M. Crowther
Sand-mold-forming machine.....F. Herbert
Sand-mold-forming machine.....W. C. Swift
Sand-mold machine.....W. C. Swift
Sand-mold-making machine.....F. Herbert
Seal-lock.....H. V. Conover
Sealing device, Bottle-.....A. Hostettler
Seat-cushion.....T. N. Burke
Sectional boiler, Vertical.....W. M. Mackey
Seeder.....G. E. Swanson
Seeds, Separating buckhorn and plantain seeds from clover-.....J. P. Burgess
Serums and other substances, Apparatus for containing and injecting.....J. L. Overton
Sewing-machine.....R. G. Woodward
Shaft end.....C. E. Titchener
Shearing and punching mechanism.....J. I. Depew
Sheet-metal-cutting rolls.....L. C. Steele
Shoe.....E. G. Healey
Shoe-form.....C. A. Batchelder
Shoe-form.....W. C. Richardson et al
Shredding-machine.....W. E. Williams
Shutter-worker.....W. J. Aumen
Sign, Electric.....D. F. Miller
Signals, Automatic brake-operating attachment for.....W. C. Patterson
Signaling and switching apparatus, Electrical.....R. H. Manson
Signaling apparatus, Electrical...B. F. Wooding
Signaling system, Electric.....J. G. Nolen
Skirt and waist hanger.....C. W. Hewlett
Skirt-holder.....E. T. Neumann
Skylights and similar constructions, Bar for.....J. Leppla
Slat-weaving machine.....H. W. Carpenter
Sled-shoe.....W. C. Abelson
Slicing machine, Vegetable-.....J. J. Vavruska
Slubbing, reducing, and roving frames and like spinning and twisting machines, Combination guide and alarm for.....J. Lumb
Smoke and the like, Automatic apparatus for detecting.....H. Darwin
Soda-water fountain.....L. G. Green
Soldering appliance.....C. C. Blake
Sole-laying machine.....J. J. Heys
Sound-reproducing mechanism, Starting means for.....P. M. Ravenskilde
Spanner and wrench.....J. Sinclair
Spark-timer.....D. Almy
Spinning machine, Yarn-.....L. Dugauquier
Spring-wheel.....W. J. Phelan
Stamp, Self-arighting.....E. A. Kirchner
Stamping machine, Envelop-.....O. M. Human
Stanchion, Cattle-.....H. Siedschlag
Stand-pipe.....J. Henderson
Steam-boiler.....I. Williams
Steam-generator.....J. Blake
Stencil-holder.....P. J. Weber, Jr.
Stoker, Chain-grate.....A. E. Parker et al
Stone machine, Artificial-.....T. A. McMurtrie
Store-front.....W. H. Hoover, Jr.
Stove.....E. C. Cole
Stove attachment.....M. E. Wood
Stove, Heating-.....H. Wagner
Stove, Heating-.....J. J. Harpel
Stoves, Adjustable top for cooking-.....W. A. Stowe
Stuffing-box for throttles and valve-stems.....J. Maloy et al
Suit-hanger, Lady's.....E. T. Neumann
Swing.....O. P. Vroom
Swingletree.....M. Hicks
Switchboard-signal, Electromechanical.....E. W. Brackett
Syringe, Vaginal.....E. Hilker
Talking-machine.....J. C. English
Taper-turning tool.....J. Hartness
Teat-cup.....F. B. Groff
Telegraphic transmitter, 2 pats....P. B. Delany
Telephone central-office apparatus.....C. S. Winston
Telephone drop and jack, Combined.....H. C. Thomson
Telephone-exchange system.....S. B. Fowler
Telephone-switch.....W. M. Bruce, Jr.
Telephone system.....A. L. Parcelle
Telephone system, Lock-out.....A. F. Poole
Telephone system, Party-line.....A. F. Poole
Telephone-transmitter.....W. W. Dean
Telephones, Lock-out device for party-line.....W. M. Bruce, Jr.
Thermometer.....S. Lachapelle
Thill-coupling antirattling device.....H. E. Vosburgh
Thread-cutting device.....R. A. Smith
Time-switch, Automatic.....H. B. Snell
Tire construction.....W. F. Stearns
Tire, Pneumatic.....O. Uhlmann
Tire, Pneumatic.....H. D. B. Lefferts et al
Tire-setting tool.....R. Connell
Tire, Supplemental detachable vehicle-.....H. Yarnell
Tire, Tubular metallic spring-.....J. K. Parker
Tobacco box or caddy.....A. J. Feild
Tool, Combination-.....E. B. Dikeman
Tool, Pocket-.....A. F. Meisselbach et al
Toy bear.....I. Parmly
Trace-earrier.....H. Hill
Trolley.....J. E. Saueier
Trolley-brush.....G. Heineman
Trolleys, Mechanism for locking...E. Y. Moore
Truck frame, Railway-.....C. Furman
Trunk-fastener.....G. J. Loos
Trunking system, Automatic.....C. S. Winston
Truss.....L. H. Davis
Truss for iron structures.....H. C. Matthews
Tube-manufacturing apparatus, Metal-.....A. Schwieger
Tube or flue cleaner.....J. R. Middleton
Turbine.....R. H. Goldsborough
Turbine, Expansible-fluid.....B. S. Church
Turbines, Means for cooling the supply-passage of gas-.....J. W. A. Elling
Turn-table.....H. Hastings
Type-casting means.....F. H. Brown et al
Type-writer.....W. Goerwitz
Type-writing machine.....T. J. Coo
Type-writing machine, 3 pats.....H. H. Steele
Type-writing machine.....J. Felbel
Type-writing machines, Shift mechanism for.....J. B. Secor
Umbrella or parasol frame.....A. Blake et al
Valve.....H. Brauner
Valve, Antisiphon-.....W. B. Thomson
Valve for flushing-tanks.....G. G. Seymour
Valve for stench or water-seal traps, Air-.....G. W. Renton
Valve, Furnace-.....C. Longenecker
Valve-gate and operating means therefor.....A. Suck
Valve, Mixing-.....R. Rost
Valve, Reducing-.....G. W. Collin
Valve, Steam-pressure-reducing....G. W. Collin
Vamp-folding machine..G. F. Dunn. (Reissue.)
Vapor-burner.....F. Kitzsteiner
Vaporizer for medicaments.....E. L. Loveless
Vehicle-brake.....W. J. Watson
Vehicle, Motor-.....J. Latzel
Vehicle-spring.....C. A. Meredith
Vehicle-spring.....G. Schwarz
Vehicle-spring.....R. H. Stevens et al
Vehicle-wheel.....W. E. Schneider
Vehicle-wheel.....G. W. T. Akehurst
Vehicle-wheel.....P. W. Waltz
Vehicles, Air-compressor machanism for self-propelled.....E. E. Hampton et al
Vehicles, Apparatus for cooling the brakes of motor road-.....J. Caillet
Vehicles, Removable sleigh-runner for.....H. H. Walsh
Vein-tube.....W. H. Freeman
Ventilating device.....J. L. Waterbury et al
Ventilating system.....P. J. Conroy
Ventilator.....J. Lorenz
Ventilator.....A. A. Packer
Vibrator.....W. N. and F. W. Nicholls
View-finder.....H. J. Winter
Violin and the like.....J. W. D'Armon
Wagon.....F. W. Bleckley
Wagon-bolster.....F. W. Bleckley
Wagon-brake, Automatic.....G. M. Olson
Wall-mold.....J. W. Holman
Washing-machine.....D. A. Sawyers
Watch, Stem-winding.....R. Manthey
Water-closet flushing-valve.....W. Turnbull
Water-elevator.....M. R. Shourds
Water-elevator.....J. A. Goodner
Water-heater.....H. Anderson
Water-motor.....F. A. Dinsmore
Water-pressure motor, Rotary....P. T. Coffield
Weighing apparatus for farm-wagons, Portable..J. D. Reed
Winding and cutting machine....C. A. Marquis
Window.....A. Straubhaar
Window-washer.....G. P. Young
Wire-baking oven.....H. B. Humphrey
Wire-die safety appliance.....J. H. Reece
Wire handle for paper vessels....C. T. Bloomer
Wire-reels, Automatic safety appliance for.....J. H. Reece
Wool, Mordanting.....P. Rogers
Wrench.....J. F. Fisher
Writing device.....W. C. Massey

DESIGNS.

Atomizer.....C. W. Meinecke
Barrel-cover.....T. E. Ragland
Bead ring.....I. F. Scullin
Comb.....S. Williams
Dish, Metal.....W. Kilian
Electric-light cluster.....R. B. Benjamin
Fabric, Pile.....F. E. Kip
Fabric, Textile.....H. P. Johnstone
Fabric, Textile.....H. Jacobson
Glass dish or similar article....W. E. Egginton
Harness ornament.....S. W. Reynolds
Locket or similar article.....F. W. Arnold
Pavement.....F. F. Landis
Rug.....A. Petzold
Spoons, forks, or similar articles, Handle for.....G. P. Ittig
Whistle or siren, Mechanieal.....J. Gordon, Jr.

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Adhesive composition.....M. Smetana
Adjustable table.....J. C. Lewis
Air-brake apparatus.....H. F. Bickel
Air-compressor.....L. C. Trent
Amusement device.....J. Wunner
Annealing furnace, Metal-.....R. H. Ward
Apparel fastening device, Wearing-, L. V. Smith
Asphalt-ripper.....A. King
Auger-head and reamer, Combined.....E. J. Wheeler
Automatically-locking box.....F. C. Few
Automobile.....L. M. G. Delaunay-Belleville
Automobile-door hinge.....E. T. Robinson
Automobile driving mechanism..H. K. Holsman
Automobiles, Apparatus for making seat-bodies for.....M. H. Kashian
Automobiles, &c., Driving mechanism for.....H. K. Holsman
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Barium eyanid, Production of....K. Bosch et al
Bark from logs, Machine for removing.....G. S. Witham, Jr.
Basket-handle.....J. Higman
Bearing, Ball-.....A. T. Matthews
Bedstead, Wardrobe-.....W. E. Ingram et al
Beet-puller.....L. Prue et al
Belt.....H. J. Reynolds
Belt, Endless conveyer-.....I. F. Manning
Belt evener, Conveyer-.....F. Martin
Belt-fastener.....G. M. Harrison
Berth, Ship's.....F. L. Ames
Beverages from pure hemoglobin and fermentable sugar, Producing vinaceous..F. G. Sauer
Binder.....I. F. Rubel
Bib.....M. S. Thompson
Bit.....G. Harris
Blind-tenon.....C. Miller
Boat, Twin-screw submarine.....L. Y. Spear
Boiler.....E. E. Larrabee
Boiler-tube-cleaning apparatus..H. F. Weinland
Bolt-securing device, Split-.....J. J. Souder
Book, Record-.....F. O. King
Boring tool, Earth-.....A. Beldiman
Bottle-conveyer.....W. Stender
Bottle-filling apparatus.....D. J. Davis
Bottle, Non-refillable.....M. W. Pitner
Bottle-stopper.....M. Anderson, Jr.
Box.....A. S. Ray
Boxes, Machinery for use in making wire-bound.....J. J. Miller
Brake mechanism.....H. E. Coffin
Brake-setting mechanism, Automatic.....W. P. Byrd
Brooder.....J. A. Jocoy
Brush.....R. C. Bryant
Brush.....J. F. Scanlan
Brush, Cleaning-.....R. T. Gillespie
Brush, Fountain bath-.....W. E. Allen
Bucket, Clam-shell.....C. C. Williams
Buckle.....B. Bixby
Buckle, Harness-.....D. C. Pasley
Buckle, Harness-.....D. H. Young
Building-block core.....E. Rhodes
Burial-case.....C. Pianta
Burial-casket carrier.....L. H. Montross
Burial-caskets, Face-plate for.....National Casket Company. (Reissue.)
Burner.....L. D. York et al
Button, Cuff-.....G. W. Dover
Button, Mechanical.....F. Stashko
Buttoning device, Collar-.....F. Bailey
Cabinet table, Kitchen-.....W. A. Campbell
Cable-terminal.....F. B. Cook
Cam.....J. C. H. Vaught
Camera-shutter release.....C. C. Little
Camera, Stereoscopic.....M. Vineent
Can feeding and righting machine.....M. D. Blakeslee
Cane-cutter.....E. M. Hibbler
Cane-stripper.....B. E. Bagley
Car, Convertible.....E. T. Robinson
Car-fender.....E. F. Normandin
Car-fender.....F. Halm
Car-fender.....W. S. Fister
Car frame, Railway-.....W. F. Kiesel, Jr.
Car, Hand-.....J. E. Durham
Car-heating sytem.....L. T. Gibbs
Car, Semiconvertible.....E. T. Robinson
Car-stanchion.....R. P. De Remer
Car-wheel.....M. Hendricks
Car-wheels, Device for the inspection of, 2 pats.....C. Browning, Jr.
Cars, Double body-bolster for railway-, 2 pats..J. M. Ames
Cars, Interior finish of steel railway-.....W. F. Kiesel, Jr.
Carbonated liquid.....H. B. Brehaut
Carbureter.....L. Anderson
Carbureter.....W. A. Cahill
Carbureter for explosion-engines.....W. H. Newbrough
Carding-engine, Traveling-flat..F. E. Kip et al
Carriage hood.....T. Golde
Cart, Self-loading.....E. S. Pearson
Cash-register.....T. Carroll
Cement-block and brick machine..S. M. Kimble
Cement-block machine.....R. Endsley
Cementing and snipping machine, Rotary.....H. I. Illingworth
Centrifugal machine.....W. L. D'Olier
Centrifugal machines, Journal-support for.....K. K. McLeod
Chain, 2 pats.....H. B. Newhall
Check-hook.....E. L. Burk
Chimney-cap.....W. Lincoln
Chuck.....W. Mauss
Churn.....E. A. Collin
Clamp-bar.....E. Barker
Clock, Electric.....N. Friedman
Clock key and securing device therefor, Watchman's-, 2 pats.....A. A. Newman
Clock marking device, Watchman's-, 2 pats.....A. A. Newman
Clod-crusher.....D. Lumsden
Closet-flushing valve.....W. Kelly
Cloth rolls, Machine for winding and cutting.....A. L. Adams
Clothes-drying machine.....S. B. Danc
Clothes-pin.....A. M. Harris et al
Clothes-pole.....D. G. De Milt
Clutch.....F. Starr
Clutch, Fluid-.....W. W. Henderson
Clutch, Friction-.....C. R. Greuter
Clutch-operating device.....M. Roekstroh
Cock, Cylinder-.....A. Sundborg
Color-lake, Red.....K. König
Comb.....A. A. Angus
Composition of matter.....R. F. Nowalk
Compound engine, Reversible explosive.....E. J. Woolf
Concentrating apparatus.....P. T. Hambrie
Concentrating-tables, Box cleaning device for..E. H. Shackelford
Concentrator.....M. P. Boss
Concrete pile.....J. M. Braxton
Concrete vault.....B. Kinsey
Condenser, Smoke and fume..J. T. Yates, et al
Controller.....W. J. Warder, Jr.
Conveyer.....G. E. Richmond
Conveying apparatus.....J. H. Gilman
Cooker, Straw.....J. J. Dauch et al
Coop, Poultry-.....V. S. Weekley
Cop-tube.....S. W. Wardwell
Core-drilling apparatus.....C. A. Terry
Cork-extractor.....G. M. Godfrey
Corn-husking machine, Green-.....L. J. Coryell
Corn-popping machine.....L. M. Wesner et al
Corn-sheller cleaning apparatus.....F. Hall
Cotton-chopper.....J. H. Kennebrew
Cotton-compress.....J. W. Gregory
Cream and other liuids, Apparatus for tempering.....D. W. Payne
Crusher and pulverizer.....M. F. Williams
Culinary vessel.....G. W. and J. A. Terhorst
Current rectifier, Alternating-.....G. W. Pierce
Currycomb.....E. Johnson
Curtain-stretcher and clothes-drier...C. E. Rice
Cuspidor.....L. O'Dell et al
Cut-off and strainer for water-pipes, Combined..J. A. Young
Cutting implement, 2 pats.....A. A. Low
Dam, Shell-.....E. B. Jennings
Desiccating apparatus.....H. Paueksch
Display-can, Sheet-metal.....C. T. Draper
Display-rack.....F. Dow
Distillation.....T. A. Dungan
Distilling apparatus, Coal-, J. W. Aylsworth et al
Door-check.....A. Cairns
Door check and spring, Combined..W. Gilfillan
Door-holder.....G. Buschur
Door-loek.....W. A. Markey
Door, Metallic.....J. E. Fox
Draft-equalizer.....C. P. Dyar
Draft-equalizer.....L. W. Raueh
Dredge-bucket joint.....A. T. Fraser
Dredging-bucket and hoist for same, Triangular.....C. H. Gunn
Drill-post, Coal-Mining.....P. Rommes
Dropper.....B. W. Phelps et al
Dust separating and collecting apparatus.....A. Knappenberger
Dye and making same, Azo.....P. Julius et al
Easel, Artist's.....R. F. Maynard
Egg-boiler.....H. H. Chesbrough
Egg-boiler, Automatie.....L. Leclere
Electric bracket, Swinging.....J. F. Brown
Electrie heater.....W. R. Whitehorne
Electric installation working with turbo-dynamos and accumulators.....M. Grob
Electrie wires, Tool for.....H. B. Barnes
Electrical-distribution system....R. S. McLeod
Electrical vapor apparatus..H. L. Campbell et al
Elevator safety appliance.....F. M. Ashby
Elevators by means of a switch, System for controlling the motion of electrically-operated...W. Baxter, Jr.
Endoscope or other optical instrument.....R. H. Wappler
Engine.....R. M. Downie
Engine attachment, Traction-.....V. Landholm
Engine fuel-feeding mechanism, Internal-combustion, 2 pats.....F. W. Brady
Engine igniter, Gas and gasoline.....M. G. Voigtlander
Engine vaporizing device, Internal-combustion..F. W. Brady
Engines, Magneto-electric igniter device for explosive-.....O. Carlborg
Engines with four cylinders, Starting device for explosion-.....H. Saurer
Erasing device.....J. S. Rapson
Erasing instrument.....I. Lueas
Exercising apparatus.....E. A. Letzkus
Eyeglasses or spectacles.....G. Bausch
Fabrie.....R. A. Dunning
Fabric-cutting machine.....A. Heil
Fabrics, Apparatus for inverting tubular.....W. B. Palmer
Fan, Automatic.....J. Mason
Fastener.....W. B. H. Dowse
Fastener.....A. G. Mead
Fats, oils, and the like, Extracting.....E. Berliner
Feed-regulator.....W. Engelbrecht
Feed-regulator.....M. F. Williams
Fermenting beer, ale, and other fermentable liquids.....H. H. Freund
Filing-box.....E. C. Holland
Fire-escape, Portable.....B. M. C. Walter
Fire extinction, &c., Multiple-way valve applicable to devices for gaseous.....T. A. Clayton
Fire-guard.....C. H. Reeves
Fireproof building, Cement.....P. Timofeeff
Fish stringer or holder.....O. C. Guilford
Fish-trap.....A. Murdoch
Fishing-rod trimming.....W. R. Wheeler
Floor system.....T. Schillinger
Flour-bleaching apparatus.....G. B. McFarland
Folder.....O. Roesen
Folding seat.....J. Z. Miller
Form for garments, Presser-.....J. M. Stein
Framing-spacer, Automatie.....J. Broadley
Friction-top can.....K. S. Breckenridge
Fruit and vegetable cutter.....S. D. Smithwick
Fuel, Machine for manufacturing peat.....R. A. Kellond
Furniture-fastener.....J. W. Sprout et al
Furniture, Store.....W. E. Bailey et al
Galleys, End piece for.....O. L. Carter
Game apparatus.....F. H. Cook
Garment-supporter.....J. M. Johnson
Gas-conduits, Automatic water-level controller for water-separators of.....A. Billouez
Gas-engine.....W. T. Maxwell
Gases, Separation of.....J. Dewar
Gate.....T. J. Hightower
Gearing.....C. Campo
Gearing.....B. A. King
Gearing, Transmission-.....A. O. Carman
Gearing, Transmission-.....E. B. Cribb
Gearing, Variable-speed.....B. M. Coffee
Gluing-clamp.....E. Barker
Governing device, Automatic....G. M. Speneer
Governor, Gas-engine.....J. V. Rice, Jr.
Grader, Road-.....E. Lee
Grain-mill.....S. Vessot
Grain-shakers, Strain-equalizer for.....E. Anderson
Gramophone-record tablets, Making.....H. S. Berliner
Grease-eup.....F. Beemer
Gun, Air-.....D. F. Polley
Gun-rest.....J. Jeranek
Gun-sight, Adjustable.....L. C. Bevier
Guns, Collimating-sight for heavy, E. L. Zalinski
Half-tone cuts, Making.....M. C. Cochran
Hame-fastener.....T. Pangburn
Hame-fastener.....J. W. Gonce
Hammer, Bush-.....A. Pinel
Hammer, Pneumatie.....J. Keller
Handle-brace.....W. H. Coldwell
Harness-rosette.....E. A. Pflueger
Hat-holder.....M. F. Ma-Loney
Hay-barraek.....G. A. Walker
Hay-press.....J. M. and E. C. Holderfield
Headlight for horses.....E. L. Richards
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Heels to boots and shoes, Maehine for attaching.....V. Sandahl
Hemp-brake.....G. E. Worth
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Horse-detacher....Z. A. Lively
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Ice-can....P. C. Burhans
Ice-cream freezer....B. G. Butler
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Lantern, Top-draft....W. F. Fresh
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Projectile....J. A. Bon
Propeller, Hand-power....J. C. Weir
Pulley, Split sheet-metal....L. A. Biggar
Pulverizer, Centrifugal-impact dry....L. C. Graupner
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Pump operating with auxiliary turbines, Rotary or centrifugal....H. Ludewig
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Rock-cleaving machine....J. Pierson
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Sasb fastener, Window-....E. B. De La Matyr
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Sash-lock or window-fastener..L. Vander Weel
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Separator system, Pneumatic....W. S. Osborne
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Shade-edge-holding device....F. J. Thompson
Shade-roller bracket....A. H. Fleming
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Sheet-feeding apparatus....A. B. Dick
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Sheet-metal guaze or grating....M. W. Pitner
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Shoes, Elcctric-heated hand-molder for filling..A. Thoma
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Sifter....C. D. Marlow
Sign, Advertising street-car....A. King
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Slicer, Fruit-....M. B. Jolly
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Slip-clip....S. W. Reynolds
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Sulfur from sulfur-bearing gases, Recovery of....P. S. Smith
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Telephone memorandum and recording device..U. G. Cave
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Telpher....H. M. Harding et al
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Truck, House-....J. H. Lyon
Truck, Logging-....J. W. Emerson
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Type-writing machine....J. C. McLaughlin
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Vehicle-wheel....T. W. Rieder
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Vehicles, Speed-controlling mechanism for motor....G. W. Dunham
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Wire screen....C. B. Harroo
Wrench....D. F. Rossard
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Crusher....M. G. Bunnell
Crushing clods of earth, &c., Implement for....D. Meinen
Crushing-mill....F. A. Huntington
Crushing-mill feeding mechanism....F. B. Pettingill
Cuff-pin and other analogous article of jewelry....J. S. Brant
Cultivator....S. H. Young
Cultivator, Lister-....C. H. Melvin
Culvert-mold....E. T. Morris
Curette, Uterine....F. T. M. Moormeister
Curtain appliance, Window-....L. H. White
Curtain-fixture....G. H. Forsyth
Cushion-tire wheel....C. A. Marien
Cuspidor....C. Peter
Cut-off slide....J. F. Dornfeld
Cutter-heads, Knife-holder for....A. Thorsby
Cutting and folding machine....R. C. Seymour
Cystoscope....R. H. Wappler
Dental engine, Manually-controlled....J. L. Gauthier
Dental implement....J. Gartrell
Denture....R. M. Craig. (Reissue.)
Desiccating apparatus....S. P. Rasmussen
Diaper-holder....F. Jonata
Disk drill....A. Armitage et al
Display-box....S. L. Bachrach
Display-cabinet....F. D. Maguolo
Display cases, Extension-bracket for garment-....L. W. Welch
Display mechanism, Check-controlled....W. R. Benjamin
Distilling apparatus....W. H. Bartholomew
Ditcher and road-grader....W. Larkin
Door catch and lock, Screen-....H. Hunter
Door fastener, Sliding-....H. L. Rued
Door-holder....E. Hodgson
Door, Sidewalk-....O. R. Schrader
Dough-mixing machine....A. Roth
Dough-rising cabinet....W. P. Magner
Draw-jack....E. B. Tarr
Drawer and drawer-support....H. B. Starrett
Drawing-table....L. Forsyth
Dredgers, Means for advancing..R. M. Wilson
Drier....K. F. Snow
Drill attachment....W. H. Adams
Drills, Making....L. Gregson
Drilling and nailing machine....H. Winter
Drilling-machine and the like, Centering apparatus for portable....E. Burckhardt
Drop-light fixture and the like...A. C. Davidson
Dye and making same, Brown azo..G. Kalischer
Dyes containing radicals of higher fatty acids, Making azo....N. Sulzberger
Ear-drop, Pierceless....J. S. Brant
Egg-lifter....C. F. Swanson
Egg-tester....C. F. Swanson
Electric-circuit controller....C. Aalborg
Electric circuits, Means for automatically closing....F. W. Keeler
Electric generator for telephone-lines....H. Tideman
Electric-light plug, Extension....B. D. Horton
Electric service wires and cables, Support for....E. H. Greenleaf et al
Electric transmission of intelligence, 2 pats....I. Kitsee
Electric-distribution system....R. M. Palmer
Electromedical appliance....S. H. Lackland
Electropneumatic drill....O. S. Proctor
Elevator-doors, Device for automatically opening and closing....W. J. Jeffries
Elevators, Regulating magnet-controller for electric....H. P. McCall
Embroidery-hoop....F. E. Kohler
Engine-cooling device....G. Wolke
Engine-cooling means....K. R. Wilson
Engines, Mechanism for gasoline-..P. W. Dillon
Eraser, Blackboard-....W. H. Hartley
Excavating-machine....F. M. Wrabek
Excavator....O. Schaller
Expansible bit....E. Pastore
Explosion-engine....C. R. Pearson
Explosive-motor....C. R. Gergler
Eyeglasses....G. H. Chapel
Fabric-cutting machine....A. Roos
Fabrics, Smooth-edger for....J. G. Dorward
Face-cooler....C. W. Pearsall
Farm-gate....O. M. Hurst
Farm-gate....J. R. Goode
Feed device or feed-hopper....H. D. Conway
Feed-trough....E. A. Lee
Feed-water heater....W. H. Brown
Feeder, Mechanical..T. L. and T. J. Sturtevant
Feeding-trough....L. L. Hughes et al
Fibers, Apparatus for making mixed....P. M. Hamlin
Filing devices, Follower for paper-..A. T. Weiss
Filter....B. F. Schirmer
Filter....J. R. Judge
Fire-alarm....D. G. Thalman
Fire-escape....J. W. Campbell
Fire-extinguishing compound....C. Howard
Fish-trap....J. W. Angel
Fish-trap....R. E. Allday
Fishing-reel spool....W. Shakespeare, Jr.
Fishing-tool....W. H. Button et al
Flashback-stop....D. O'Keefe
Floor-joint for soil-pipes....F. Jackson
Flow-controller, Automatic, 2 pats....J. W. Ledoux
Flue-stop....C. C. Luman
Folding-machine packing mechanism....C. A. Sturtevant
Force-feed lubricator....E. L. Stuck
Fork-scraper....W. H. Abts
Friction coupling or clutch....C. Krämer
Friction-spring....P. Hien
Fruit-box, Folding....H. F. Padgham
Fruit-jar....W. J. Perritt
Furnaces, &c., Ash-collecting box attachment for....J. Galvin
Furnaces, Mechanical ore-feeder for blast-....F. S. Sanderson
Fuse-block, Automatic multiple....W. C. Mayo et al
Game apparatus....A. Iwan
Game-counter....J. C. Lewis
Garment....J. M. Van Orden
Garment-fastener....G. W. Cummings, Jr.
Gas and acetylene burners, Lighting attachment for....C. J. Larkin
Gas-burner....E. S. Lauhon
Gas-burner....E. E. Kehnert
Gas burner, Natural-....J. W. Chamberlain
Gas-engine....J. S. Benson
Gas, Manufacturing....C. H. Rider
Gas-manufacturing apparatus, Fuel-..C. H. Rider
Gas-pressure regulator....P. Keller
Gas-producer....R. B. Cissel
Gas-producer....G. J. Weber
Gas-purifier....W. Towns
Gate....O. J. Wyman
Gate....O. Van Tassell
Gear-generating machine....E. R. Fellows
Gearing....N. E. Howard
Gin-feeder, Pneumatic....R. L. Hollingsworth
Glass, Table for casting....L. Rembaux
Glass vessels, Apparatus for removing glaze from....J. A. Hicks
Goggles....C. F. Dieckmann
Grader drag, Duplex road-....G. Alexander
Grader, Elevating-....L. V. Brophy
Grader, Road-....F. Hummel
Grain-cutting machine....J. T. Neild
Grain-drill....T. B. Rowell
Grain-shockers, Tripping and bundle-counting mechanism for....J. Boda
Grate, Water-cooled....W. C. Richardson
Grater, parer, and corer, Combined....C. E. Segelcke
Grinding-machine, 2 pats....A. B. Landis
Grinding-machine work-rest....J. J. Thacher
Grinding or polishing wheel....C. B. Wattles
Grinding-roller, Antifriction....H. Besser
Hair dresser and trimmer..R. A. McDonald et al
Hair-tonic....F. J. Pieper
Hame-fastener....A. B. Corcilius
Hammock-stand....H. M. Underwood
Hand, Artificial....C. M. Broady
Harrow riding attachment....C. S. Sharp
Hay and hog rack....C. O. Strubhar
Hay-press....M. I. Wilson
Headlight....G. W. Brown
Headlight blind, Locomotive-....F. J. Fewings
Hem-finder....G. F. Oldham
Hinge....J. R. Hartman
Hinge construction for safe and vault doors, Adjustable....J. H. Williams
Hoisting and conveying apparatus..J. W. Cooper
Hoisting device....H. J. Schmick
Horse-hitch....W. H. Collins
Horseshoe, Detachable....E. R. Lubbers
Hub, Vehicle-....W. M. Preston
Hydrocarbon-motor....A. A. Low
Incandescent bodies for incandescent lights, Apparatus for handening...M. Sensenschmidt
Incandescent burner....A. G. Fell
Indicator-buttons, Making....H. Mueller
Ink-well....J. D. Woods
Inkstand....J. W. Jacobus
Inkstand....F. A. Fricker
Insect-destroyer....J. S. Peek
Insect eggs and larvæ, Destroying....A. E. Nienstadt
Instep-pad....M. Dorrity
Internal-combustion engine....J. Braunwalder
Iron, Purifying....E. von Maltitz
Ironing-machine....L. C. Lewis
Journal-box, Car....E. Good
Kitchen appliance....M. R. Haberman
Knitting-machine....R. W. Scott
Knitting-machine brake, Automatic..G. A. White
Knitting-machine cam-adjusting mechanism....G. L. Ballard
Knitting-machine thread-feeding mechanism....W. D. and L. C. Huse
Lacing and tongue holder, Combined shoe....C. J. Key
Lamp, Arc-....O. Könitzer
Lamp control, Incandescent-....R. E. Kimball
Lamp, Incandescent....A. G. Fell
Lamp socket, Electric-....R. B. Benjamin
Lamp socket, Electric-....G. W. Goodridge
Lantern-holder....A. W. Mitchell
Last, Non-detachable hinged....C. B. Kosters
Latch, Duplex gravity gate-....C. W. Owens
Lawn cleaner and cultivator....H. C. French
Leaf and binder, Adjustable....D. C. Anderson
Levulose, glucose, &c., Making....F. L. Stewart
Lifting-jack....W. E. Maxwell et al
Lifting-jack....E. E. Ryan
Lifting-jack....D. W. Reardon
Lightning-arrester....G. W. Clark
Linotype-machine....J. B. Bell
Liquid-actuating apparatus....R. Conrader
Liquid-concentrating apparatus..J. H. Campbell
Liquid-meter....S. Bramley-Moore
Liquid-meter....R. Lohse
Lock-case, 2 pats....H. R. Towne
Locomotive-crank-shaft bracket..L. E. Feightner
Locomotive safety appliance, Steam-....C. A. Howard et al
Loom-heddle....H. W. Hakes
Loom-shuttle....J. Varley
Loom-shuttle tension device....H. Lindsay
Loom, Weft-replenishing....R. Crompton
Looms, Bobbin for cotton-....J. E. Lemyre
Looms, Thin-place detector for...W. F. Clayton
Low-water alarm....G. Yeates
Lubricator....F. F. Johnson
Lubricator....P. J. Sweeney
Mail-box....C. C. Myrhow
Mail-catcher....J. H. Earle et al
Manure scraper and loader....S. R. French
Measuring and clamping printing-forms, Device for....H. Winter
Measuring device for tailors' use..M. Lo Celso
Measuring instrument, Electrical....A. H. Hoyt
Metal-shaping machine....J. M. Rude
Metallurgical furnace....F. Meyer
Milk, Concentrated whole....C. H. Campbell
Milk pasteurizer and cooler....W. Wilson
Miner's squib, match, and file case....F. Harris
Miter-clamp....T. B. Holter
Mold....W. J. Miller
Mop-wringer....W. T. Phillips
Mortise and tennon....L. P. Harris
Motion into rotary motion, Means for converting reciprocatory....W. C. Mayo et al
Mowing-machine....J. T. Tomer. (Reissue.)
Muffler, Exhaust-....A. Pratt
Music chart or table....L. R. Lewis
Musical instruments, Bellows or automatic....M. Clark
Musical-record holder....G. G. Lindstrom et al
Musical valve instrument....A. Riedl
Nail-making machine....A. Vincze
Needle....F. B. Foster
Nut and pipe wrench....W. Brandon
Nut-lock....W. C. Mayo
Nut-lock....A. Cottom
Nut-lock....O. Blais.
Nut, Lock-....I. L. and J. Abe
Nutshell-breaking and kernel-extracting apparatus....E. W. J. Trevor
Oil-cleaning apparatus....L. W. Brown
Oil-heater....J. T. Ray
Oils, Solidifying mineral....E. Raynaud
Oiling device....B. H. Paddack et al
Ordnance, Firing mechanism for....H. T. Wheeler
Ores or mattes, Treating metallic....E. Günther et al
Ores or zinc, &c., Metallurgy of....F. Meyer
Organ stop-action, Combination....A. E. Kent
Organs, Pneumatic chest for pipe-....W. C. Verney
Packet-holder....P. A. Roussel
Padlock, Permutation-....H. F. Crim et al
Paper-bag holder....C. Horrell
Paper box....C. F. Pitkin
Paper-coating machine....J. B. Morrow
Paris-green distributer, Automatic....J. P. Fullilove
Pasting machine....N. Schroder
Pea cutter, Cow-....R. Rounds
Pedestal, column, and pilaster, Ornamental....W. J. Gray
Pen, Fountain-....G. W. Bennum
Pen, Fountain-....S. H. Engelberg
Pen, Fountain-....C. W. Gaston
Pen, Self-filling fountain-....F. H. Mooney
Pen, Self-filling fountain-....P. P. Flournoy
Penmanship pupils, Arm-rest for....A. Asper
Permutation-lock....J. R. Maxfield
Peroxids, Making molten..H. Foersterling et al
Phonograph....W. W. Rosenfield
Phonograph-horn....V. H. Rapke
Photography, Color....A. Davis
Piano, Automatic....M. Clark
Piano-sounding boards, Making....A. Dolge
Picture apparatus, Moving-....S. M. Tannehill
Picture machine, Moving-....D. J. Bell
Piles, Protecting-covering for....C. W. Kennon
Piling, Interlocking sheet-....G. E. Nye
Pipe....F. P. Nourse
Pipe-cleanser....J. E. Simpson
Pipe coil, Concentric-....C. Senssenbrenner
Pipe-coupling....C. A. Huffmaster
Pipe-joint, Flexible....G. Riexinger
Pipe-lining....J. A. Snoddy
Piston-ring....H. Ford
Plane....A. Nylund
Planing machine, Metal-....E. P. Carpenter
Plant-box, Knockdown....N. Hight
Planter, Corn-....M. Mitchell
Planter, Corn-....W. S. Graham
Planter, Seed-....H. H. Wabers
Plate, Soup-....A. Cohen
Platens, Machine for turning rubber shells of....D. W. Filstead
Plowshare....C. W. McWane
Plug, Attachment-, 2 pats....R. B. Benjamin
Plug, Attachment-....D. L. Webb
Pneumatic action....H. Meyer
Pneumatic motor....C. G. Wieland
Pneumatically-operated devices, Controlling means for....R. P. Jackson
Pocket for garments, Detachable...J. W. Hayes
Poison-indicator....G. Cohen
Postal card....H. G. Taylor
Potato-digger....T. Herberg
Potato-digger....J. Moreau
Power-coupling, Yielding....W. C. Mayo et al
Press....J. Rappold
Printing and folding machinery, Signature-delivery mechanism for....R. C. Seymour
Printing machinery, Autismutting device for....E. H. Cottrell
Printing-press....W. H. Smith
Printing-press....R. C. Seymour
Printing-press, Folding mechanism for....H. F. Bechman
Propeller....A. Standau
Propulsion, Mechanism for boat....H. S. Searle
Pulley-block....C. I. Scott
Pump for corrosive fluids....E. Morterud
Pump-governor, Electric....W. V. Turner
Pump, Triplex....D. F. Lepley
Pump with funnel-shaped guide-pipes in the suction-space between the suction-pipe and ring of blades, Centrifugal....O. Krell
Pumps, Pressure-governor for....H. H. Westinghouse
Pumps, Stand-valve-extracting means for oil-well....E. A. Copeland
Pumping device, Oil-well....H. D. Haven
Puzzle....J. H. Prentice
Radiator appliance....J. A. Gorton
Rail protector, Third-....F. D. Sharp
Rails, Improving steel....R. A. Hadfield
Railway....G. Dippel et al
Railway-crossings, Automatic signal for....A. Aretz
Railway-joint....J. H. Kochenderfer
Railway, Pleasure-..T. G. and W. H. Mayberry
Railway-signal....B. E. Ahlders
Railway-signal, Electric....F. M. Hill et al
Railway signaling device....F. Bauer
Railway-switch....D. I. Griffith
Railway-train protection....B. C. Rowell
Razor-blade holder, Safety-....E. J. Deneen
Razor, Safety-....J. Heissenberger
Razor, Safety-....L. Ebner
Razor-strops, Compound for use with....J. M. Reno
Reclining-chair....J. J. Pokorny
Reduction-mill....H. B. Hebert
Reel....O. E. McMahon
Refrigerating apparatus....P. M. Bush
Refrigerating-machines, Expansion-regulator for....O. E. Levilly
Refrigerator....C. Pabst, Jr., et al
Reversing mechanism....M. W. Kouns
Revolver, Magazine-....A. Moeller
Ring traveler....E. L. Merrow
Roaster....W. G. Swart
Rolling-mill for crushing pipes, bloomings, &c....J. Eynon
Roof-covering....C. C. Dill
Roofing or siding sheets, Lap-joint for....E. G. Welch
Root-puller....R. A. Denovan
Rotary engine....E. Harrigan
Rotary engine....J. Weatherford
Roundabout....H. S. Cantrovitz
Rubber....H. O'Sullivan
Rubber compound, Article of....W. Kiel
Rubbing-machine, Portable....H. F. Holtmann
Rule, Slide-....O. L. Baumbach et al
Sad-iron heater....J. A. Walker
Saddle, Top-roll....L. T. Houghton
Sanding device....B. C. Loring
Sash-fastener....J. B. Kelley
Saw, Jig or scroll....W. E. Lawrence
Saw-swage....E. P. Armstrong
Saw-tensioning device, Band-....B. D. Stevens
Sawing machine, Wood-....A. Fairchild
Scale, Automatic weighing-....W. Steenken
Scale, Computing-....W. Peterkin
Scene-shifting device....E. Giulietti
Scissors....E. E. Flyberg
Scoop....C. G. Rollenhagen
Sealing and stamping machine, Envelop....L. M. Nielsen
Seam-pressing machine, Garment-....H. Lindestrom
Self-measuring tank....J. Heissenberger
Separating-machine, Centrifugal....H. M. Goodman
Service-box....W. Dennison
Sewing-machine guide, Folding....J. F. Foschinbaur
Sewing-machine needle....A. M. Carlsen
Sewing-machine ruffler attachment....W. M. Ammerman
Sewing machines, Automatic presser-foot-lifting mechanism for....F. W. Merrick
Shade and curtain bracket....D. S. Shutts
Shade fixture, Window-....G. E. Berry
Shaft drill, Sink-....J. P. Karns
Shaft support, Vehicle-....J. T. Minyard
Sheet-delivery....R. J. Greenway, Jr.
Shirt....W. L. Siewers
Shocker for binders, Automatic bundle-....J. McCormiek
Shoe-polishing machine....R. O. Hammond
Shooks, Stand for tying....G. Eikenburg
Show-case....A. N. Lawrence
Shutter-worker....J. W. Wooley
Sign....F. S. Townsend
Signaling apparatus....J. G. Homet
Sleigh-knee....A. H. Flint
Smelting-furnace for copper and other ores....H. H. Freeman
Smoke-consumer and artificial draft....A. H. Ford
Smoking-pipe....H. K. Saddler
Soap-dispenser....H. J. S. Lewis
Sound-producing device....J. P. Northey
Sound-records, Die-plate for stamping up....G. K. Cheney

Spark-arrester....D. McIvor
Specialist's chair....W. H. Kersey
Speed device, Changeable-....J. A. Wilkin
Speed-indicating device, Time....E. J. Hall
Speed mechanism, Variable-, 2 pats....L. Thiel
Spinning or twisting frame....L. T. Houghton
Spoke-extractor....L. P. Parent
Spring construction....W. R. Smith
Square, Separable....A. C. Waecker
Stamp-affixing machine....R. P. Dethmers
Stamp-affixing machine....H. J. Wertzberger
Stamp and label affixing apparatus....E. Goldschmidt
Steam-generator....J. Van Oosterwyck
Steel, Composition of matter employed for hardening and tempering....B. J. Casterline
Steel, Hardening and tempering....B. J. Casterline
Stenciling-machine....C. Gibbs
Stoker, Mechanical....A. R. Selden
Stool, Barber's....J. R. Draper et al
Storage apparatus....T. C. Kennedy et al
Storage battery, Alkaline....T. A. Edison
Stove, Gas....T. H. Gallagher
Stove-hood....H. Hansen
Stoves, &c., Shelf-grating for....J. Jamieson
Stretcher....A. L. Southmayd
Swing, Rotary....R. D. Patterson
Switch-plug....H. C. Froelich
Switch-signal....P. E. Bolan
Swivel....W. J. Jeffries et al
Syringe....W. B. Murphy
Tag-holder....T. Robinson
Talking-machine....A. Fischer
Tap, Beer-....J. Wawrzinski
Tapping device, Pipe-....J. H. B. Bryan
Target and shield....C. H. Petry
Telegraph-switchboard....A. T. Newman
Telegraphic transmitter....C. Brain
Telegraphic transmitter....C. Williams et al
Telegraphy, Space....L. DeForest
Telegraphy, Wireless....G. W. Pierce
Telephone-circuit....C. M. Jacobs et al
Telephone-exchange apparatus....W. A. Fricke
Telephony....M. Brooks
Telescope with displaceable reversing system....E. Neumayer
Tennis-racket....C. H. Krüger
Thawing device....J. W. Cooper
Thermometer....E. Kessling
Ticket delivering and registering mechanism....S. P. Thrasher
Tie-plates, Manufacturing....E. H. Bell
Tiling for covering floors and walls....E. M. Kilbride
Time-recording register....N. S. McNab et al
Tin-scrap, Reclaiming....E. A. Sperry
Tire clamp, Wheel-....C. Newman
Tire, Elastic vehicle-....E. L. Perry
Tire-frame, Flexible....E. D. C. Bayne et al
Tire, Pneumatic....B. F. Schirmer
Tire, Vehicle....P. E. Doolittle
Tire, Wheel-....J. H. Ryan
Tires, Making shields or armor for pneumatic....O. A. Hensel
Tobacco-pipe....W. H. Plane
Tongs, Casing-....J. W. Brackney
Tool-holder....W. F. Tracy
Towel-holder....C. Arning
Toy....A. S. Diack
Toy building-block....C. W. Frost
Toy drum....J. Chein
Tramway....P. M. Loberg
Transformer....C. L. Fortescue
Transformer, Multiple-ratio....C. L. Fortescue
Transit-head....A. C. Young
Trap....M. H. Olson
Trigger....J. C. Lodor
Trolley catcher and retriever....F. J. Gustine
Trolley-pole head....G. G. Buchanan
Trolley-retriever....R. Phillips
Trolley-wheel....J. M. Siegrist
Trolley-wheel....E. J. Harrison
Truck for tillage implements, Pole-....C. S. Sharp
Truss....H. L. Mortimer
Tube-mills, Feeder-head for rotary....W. N. Beach
Tube-transferring mechanism....R. L. Patterson
Turbine, Elastic-fluid....C. G. Curtis
Turbo-alternator....C. E. Lord
Twine-cutter....F. B. Caldwell
Type-writer....C. W. Sponsel
Type-writer....G. W. Donning
Type-writer, Electrical....G. W. Donning
Type-writing machine....B. C. Stickney
Type-writing machine platen shift-key....S. B. Prentiss
Type-writing machine ribbon mechanism....W. R. Fox
Umbrella....A. N. Sanford
Umbrella-tip....G. Kabureck
Valve, Automatic retaining-....C. Martin et al
Valve, Graduated-release....W. V. Turner
Valve, Pressure-reducing....W. V. Turner
Vehicle....N. H. Bloom
Vehicle-body, Metal....H. and A. P. Smith
Vehicle-brake....P. H. Showalter
Vehicle-door, Automatic folding....E. D. O'Brien et al
Vehicle-shaft....O. Geertsma
Vehicle steering-gear....D. E. Ross
Vehicle-tops, Curtain-operating means for....J. H. Tickerboof
Vehicle-wheel....N. A. Newton
Vehicles, Device for lubricating the wheels of....T. C. Wild
Vehicles, Foot-rest for....L. A. Jones
Vehicles, Friction transmission mechanism for power-driven....J. H. Cook
Vehicles, Mounting of road-wheels for....C. W. Fulton
Vehicles, Strain-distributing device for....J. Worthington
Vehicles, Wind-shield or weather-screen for motors and similar....H. S. Samuel
Velocipede, Water-....R. W. Kreis
Vending apparatus, Coin-controlled....R. N. and B. F. Beasley
Vending-machine....H. R. Holbrook
Vending machine, Ticket-....W. C. Mayo et al
Veneer-sawing machine....J. Farrow
Vertical lock....A. De Vilbiss, Jr.
Voting-machine....A. McKenzie
Wagon-body....H. Knox
Washboard, Renewable-front....W. G. Frost
Watch-setting machine....M. Sporleder
Water-closet....J. A. Stevenson et al
Water-closet-outlet connection....C. H. Moore
Water-heater, Electrical....M. H. Shoenberg
Water-heater, Gas....H. W. McClellan
Weaner, Animal-....J. A. Huff
Wheel-guard....M. F. Doty
Winding machine, Bobbin-....W. D. Rundlett
Winding-machine bracket-hanger....T. Lewis
Winding-roll-tension device....C. J. Harter
Windmill, 2 pats....A. F. George
Window....S. U. Barr
Window attachment....F. S. Burgess
Window-guard....S. R. Wells
Windows and doors, Antirattling device for....J. J. Halladay
Wire-working tool....P. Smith
Wool, Mordanting....S. Kapff
Wool-washing bowl....F. G. Sargent
Worm-driving mechanism....E. H. Ryon
Woven fabric, 2 pats....C. L. Christmann
Wrapping-machine....J. W. Hicks
Wrench....F. Ellis
Wrench....T. J. Hand
Wrench....P. Hawkins
Wrench....J. N. Cook
Wrench or nut-jack....W. H. Oliver

DESIGNS.

Badge....B. J. Clarke
Badge....H. L. Diehl
Box....M. M. Marcuse
Fabric, Silk....S. Y. Johnson
Fabric, Textile....P. Dupont
Fabric, Textile....R. Gattiker
Hat-holder pin....J. E. Julien et al
Jug....O. Kopel
Lamp globe, Electric-arc-....W. D. Ryan et al
Necklace....C. A. McDonald
Photographic mount....H. L. Stanton et al
Pottery jar....W. D. Brereton
Spoons, forks, or similar articles, Handle for....F. Habensack
Stick-pin....J. L. Keilman
Telephone-switch frame, Automatic....E. E. Clement
Trimming....F. M. Daniels
Type, Font of printing-....H. W. Steiger

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MECHANICAL PATENTS.

Abdominal supporter....M. Donaldson
Acoustical instrument....P. Seiler
Adding-machine....R. H. and W. A. McNair
Adding-machine....C. N. McFarland
Adding-machine carrying mechanism....C. N. McFarland et al
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(*Continued in May Number.*)

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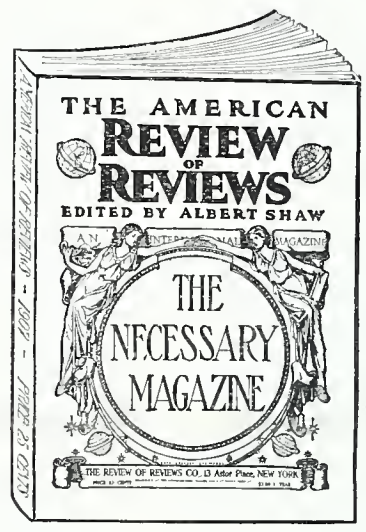
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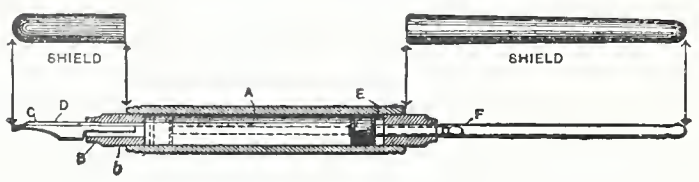
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THE LATEST BATTLESHIP ARMAMENT.

By E. OMMELANGE.

THE governments of the world take much greater interest in long range rifles, submarine fighting vessels and new armor plate, than in the most useful phase of science or art. The budgets for the army and navy are constantly growing. In spite of the new methods of attack by torpedo boats, the war vessels are every year bigger and equipped with heavier guns. Much attention has been given, of late, to the newest addition to the world's fleet of marine monsters—the British battleship Dreadnought, the largest and most dangerous of any yet constructed. The accompanying illustrations show some of the equipment of the latest type of first class fighting machines in England, and give an idea of the huge dimensions of the armament.

The 12-inch gun (shown in Fig. 1 as in position ready for firing) is the most powerful on any vessel now in commission. Its total length is 556 inches; it has a diameter of bore of 12 inches, and a length of bore of 540 inches. The total weight is 57 tons, 9 cwt.; the weight of each projectile is 850 pounds, and the muzzle velocity is 2,860 feet per second. These guns are mounted on the ship in pairs in barbettes, two forward and two aft. The gun is wire-wound, and its breech mechanism is of a new and improved type, giving considerable increase of power when closing the breech, and is arranged to be operated either by hydraulic gear or by hand power.

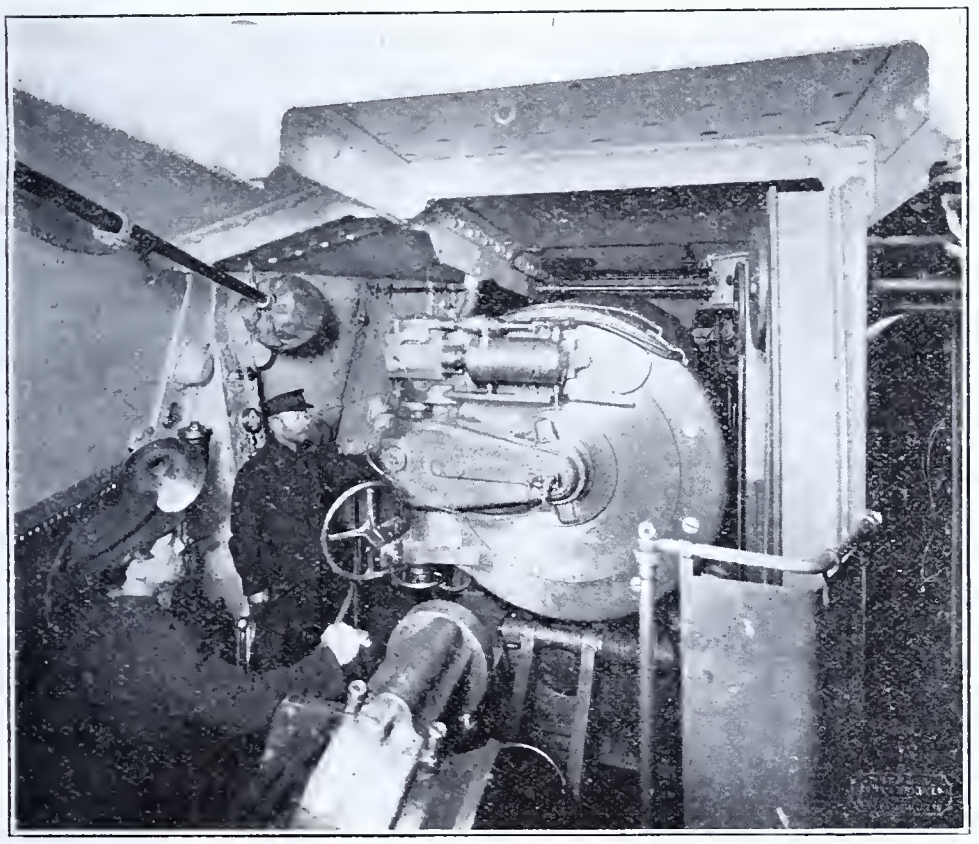


FIG. 1.—12-INCH GUN, SHOWING HYDRAULIC GEAR WITH LOADED GUN.

The hydraulic gear consists of a hydraulic ram mounted in suitable brackets on the end frame above the breech mechanism. The ram gears by means of a rack with pinion and clutch gear on the top of the hinge-bolt. This clutch is thrown out of action at any time by a hand-wheel mounted at the bottom end of the carrier hinge-bolt, and is so arranged that it is impossible to have both gears in operation at the same time. The hand gear for operating the mechanism consists of a hand-wheel, with worm and worm-wheel gear, mounted in a bracket at the lower end of the hinge-bolt, and secured to the frame of the gun.

One of the chief features of the new mechanism lies in the application of a "couple" for rotating the breech-screw. In breech mechanism as at present generally constructed, the breech-screw is rotated by a turning movement, which has been found to set up considerable friction, owing to the tendency of such movement to occasion axial displacement of the breech-screw. By applying a "couple" for this purpose this difficulty is obviated, so that the whole of the turning force applied to the breech-screw is utilized in seating the obturator.

The mountings for the gun are operated hydraulically, but most of the operations can also be performed electrically. Protection is afforded to the gun's crew, and to the upper parts of the mounting, by a heavily armored shield, securely attached to the upper surface of the turntable.

No less interesting are the ammunition hoist and loading devices. The projectile is lifted from the bins by an overhead carrier. Two jaws on the carrier drop on each side of the projectile, and the pulling forward of a handle operates toggle levers, which close the jaws around the shot. The carrier is then raised by its hydraulic press, and is moved to the base of the trunk on joist rails by means of an hydraulic ram working through cables and pulleys. The shot is deposited on a receiver, and is there held in position by stops on the top, which is inclined so that when the stops are lowered, the projectile rolls on to a corresponding receiver or bogie, which can follow the rotation of the ammunition trunk by the turning of pinions

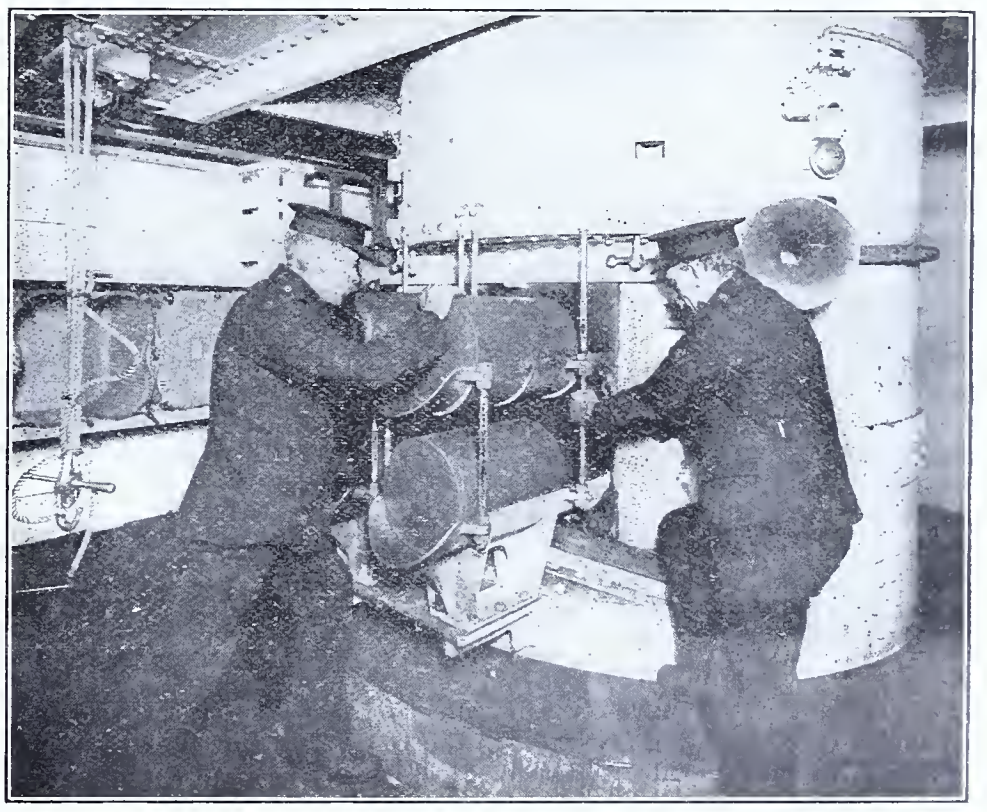


FIG. 2.—PLACING CHARGE ON THE AMMUNITION HOIST.

engaging in the toothed rack around the base of the trunk. The traversing pinion within this bogie is operated at considerable speed by a hand-wheel and worm-gear. The introduction of this intermediate bogie serves to bring the shot to the base of the hoist when the latter is revolving with the guns; the fixed receiver at the same time enables additional projectiles to travel on their way to the gun. Thus there may be one shot on the carrier, another on the fixed receiver, a third in the bogie, a fourth in the hoist to the shell chamber, where the ammunition is transferred to another hoist communicating with the charging platform, so that there may be a fifth in the upper hoist and a sixth in the gun. The ability to carry a number of shots between the shot-bins and the gun chamber renders it possible to maintain a great rapidity of fire for a short period, notwithstanding the weight of projectile and charge.

The charge is loaded up in quarters, (see Fig. 2.) within silk bags, on a level above the shell chamber, and the hoist for the charge, while within the same trunk, is independent of that for the projectiles.

In the working chamber both projectiles and powder charges are arranged to come into position at the top of their respective hoists in this working chamber for direct hydraulically-operated transference to the gun-loading cages, which rise from this level to the loading trays behind each gun. The two gun-loading hoist-cages which serve the guns are arranged to work on curved rails passing from the shell-room up into the turntable at the rear of the guns, the arrangements being such that the guns can be loaded at any angle of elevation or depression, and even with the guns moving during training operations.

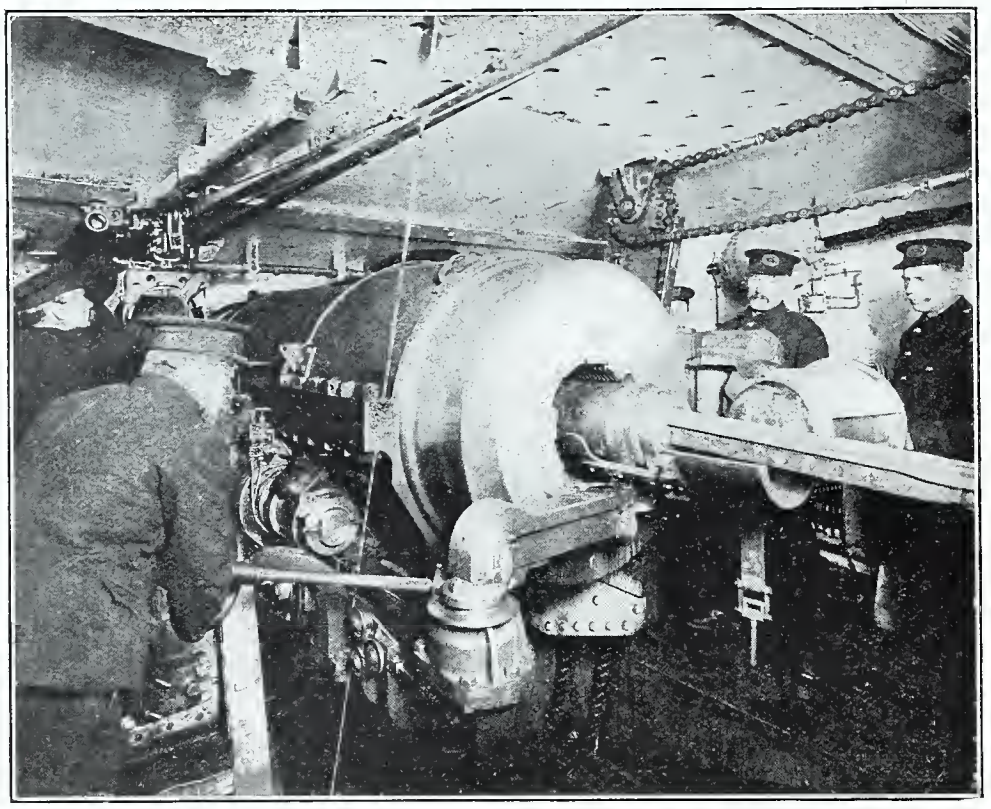


FIG. 3.—LOADING A 10-INCH GUN, SHOWING THE LOADING-TRAY.

In the 12-inch turret three sighting positions are provided, one center position between the guns being fitted with two sights, with a single sight at each side position.

The vessel also carries 10-inch guns, and Fig. 3 shows the loading tray used in connection therewith. The total weight of this gun is 35 tons, 3 cwt., and its length 464 inches. The weight of each projectile is 500 lbs., and the muzzle velocity 2,820 feet per second. The breech mechanism of this gun is very similar in principle to that of the above described 12-inch gun, except that it is operated by a hand-lever, pivoted so as to swing in a horizontal plane as seen in Fig. 3. Furthermore, the 12-inch weapons are run out by hydraulic power to the firing position, while the mounting of the 10-inch guns includes springs, which effect the return to the normal position.

THE NEXT WORLD'S FAIR.

Alaska-Yukon-Pacific Exposition at Seattle, in 1909, Now Claims Attention—Management Surprises Country by Not Asking for Government Aid—Its Progress to Date.

By FRANK L. MERRICK.

AFTER the closing of the Jamestown Ter-Centennial Exposition all eyes were turned toward the next great world's fair, the Alaska-Yukon-Pacific Exposition which will be held at Seattle, Washington, opening June 1, and closing October 15, 1909.

This exposition will be held in a section of the country where world's fairs are new, and for that and many other reasons, it is expected to be a success beneficially, educationally, artistically and financially.

Work on the grounds and buildings of the exposition is well under way, and the management is determined to have everything in readiness by opening day. This has been written about all expositions in late years, but the promise has never been completely fulfilled. The officials of the Alaska-Yukon-Pacific Exposition, however, have started out with a completed-on-opening-day idea above everything else, and if they do not carry out their plan, it will not be because western energy has not been expended in the task. The Alaska-Yukon-Pacific Exposition promises to be different from former world's fairs in many ways; but one policy stands out so far above any of the rest that the entire press of the country is commenting favorably about it. No money will be asked from Uncle Sam to carry on the work! That policy must be conceded as original.

All the management desires is for the United States government to participate in the same manner as foreign countries and the different states, by erecting buildings and installing exhibits therein. Former expositions have been aided by the government in many different ways. Outright gifts of large sums of money have been made by Congress to some world's fairs, while others have negotiated loans from Uncle Sam, some of which were paid back and some of which were not. Some expositions have received both donations and loans. As stated before, the Alaska-Yukon-Pacific Exposition will ask for neither. A clause pledging this policy has been inserted in the congressional bill making provision for participation only, by Uncle Sam.

Since the United States government began to patronize expositions down to the Jamestown fair, Congress has appropriated a total of $28,752,251 for world's fairs. Only $485,000 of this money has been spent west of the Rocky mountains. The Lewis and Clark exposition, one of the most successful ever held, receiving the benefit of that amount.

The bill that has been introduced at the present session of Congress provides an appropriation of $1,175,000 to enable Uncle Sam to take advantage of the opportunity for effective advertising. The money will be apportioned as follows:

	Building	Exhibit
Government	$200,000	$350,000
Alaska	100,000	200,000
Philippines	75,000	75,000
Hawaii	50,000	75,000
Fisheries	50,000	*

*The fisheries exhibit is included in the general government display.

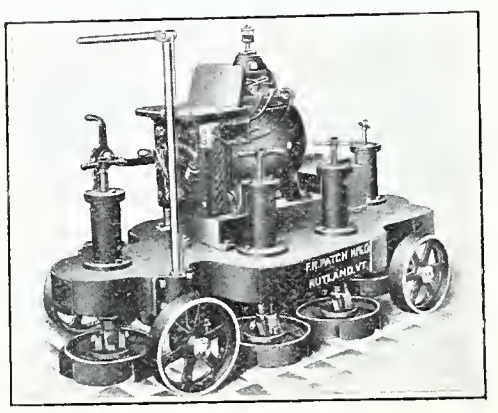
On June 1 last, before a crowd of fifteen thousand persons, ground-breaking cermonies were held, with many prominent men making addresses, among whom was Hon. John Barrett, director of the International Bureau of American Republics, representing President Roosevelt. From that date to the present time work has been going on rapidly upon the exposition grounds. Most of the grading and clearing has been finished. All of the principal roadways, avenues, circles and plazas have been completed. The Administration Building has been erected and occupied by the executive force for several months. Contracts have been let for the construction of five large buildings and several small ones. Among these are the Manufacturers building, Agriculture building, Auditorium Palace of Fine Arts and Machinery Hall. The three latter buildings will be permanent structures, built of buff brick with terra cotta trimming. The "A-Y-P", as it is sometimes called in Seattle, will differ again from some former fairs in that some of its exhibit palaces will be permanent structures. The grounds are located on the property of the Washington University, a state institution, and after the exposition is over the permanent buildings and those substantially built will be taken over by the college to be used for educational purposes.

The purpose of the exposition, which is to exploit Alaska and Yukon and the countries bordering on the Pacific Ocean, is reeeiving much favorable comment throughout the country.

POLISHING FLOORS BY ELECTRICITY.

By FRANK C. PERKINS.

Electricity is now being utilized to polish floors. With the growing wealth of our country and the increased use of mosaic, tile, and hardwood floors, has come a demand for proper methods of keeping them polished. In response to this need, an electric machine has been devised which does the work effectively.



The accompanying illustration shows this electric floor surfacer which is extremely simple, all of the driving parts being enclosed and protected from grit and water. The motor used is of 7½ horse-power capacity and is of the vertical type, geared direct to the gears on the several spindles, the motor pinions being of raw hide to reduce the noise.

Each of the grinding heads is arranged with an independent pressure device, and can be so adjusted that the pressure on any one is equal to that on all of the remaining heads, in this way making the pressure independent of the weight of the head. When it is necessary, any or all of the heads can be lifted clear of the floor. The machine is designed to be self-propelling in either direction at a speed of 15 feet per minute, being easily controlled from the operators' seat at the front of the machine.

The six grinding heads are 13 inches in diameter and run at a speed of 200 revolutions per minute. The electrically driven grinders are so arranged as to cover a track of 33 inches in width, and the wheels are fitted with rubber tires to prevent marring or scratching the floor. The heads are provided with special carborundum blocks and also with sanding heads. The entire weight of the machine is about two thousand pounds. It is equipped with complete switching apparatus, steering gear and reversing handles, together with the necessary starting rheostats and other electrical devices for controlling the mechanism.

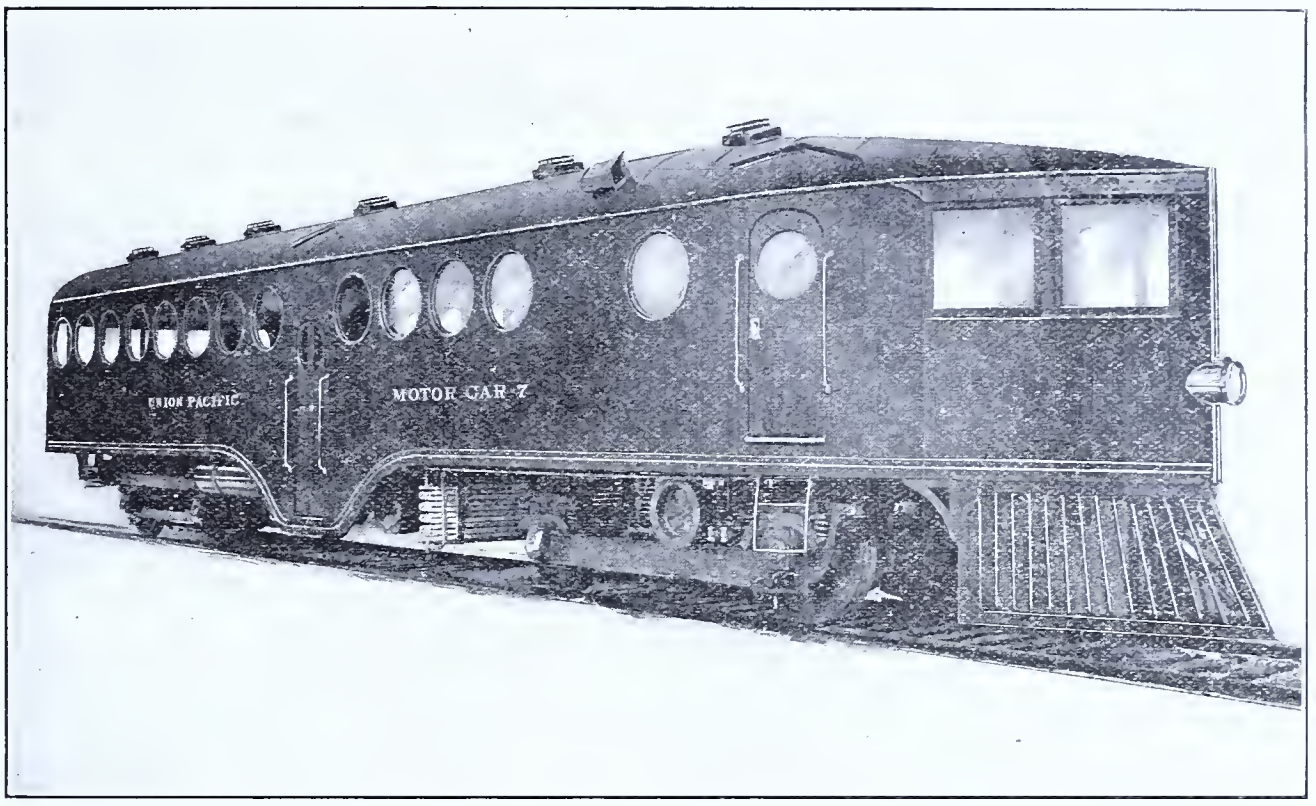
MOTOR CARS ON THE UNION PACIFIC.

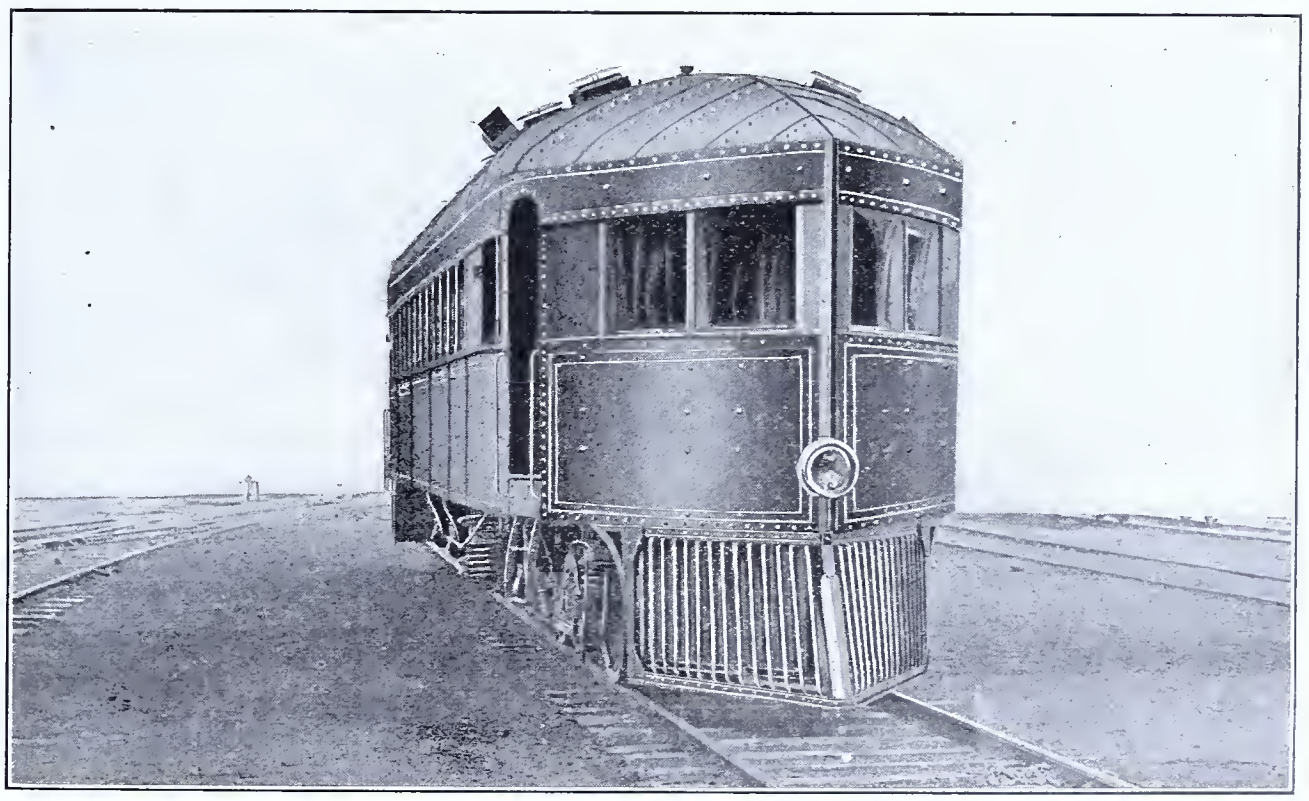
THE steps that have been made in the substitution of motor cars for the usual passenger and freight trains on railroads have been noted from time to time in the INVENTIVE AGE. The latest in this line is the adoption by the Union Pacific of the gasoline motor, and the construction of over thirty cars for general use. The reasons for this movement were set forth by the superintendent of motive power of the road in an address before the New York Railroad Club last spring. He declared that the modern locomotive and steam car are much more complicated and vulnerable pieces of machinery than the gasoline motor. With their high steam pressure and the attendant flue and fire box difficulties, the troubles due to formation of scale, broken staybolts, leaky front ends, defective draft, poor coal and other kindred evils necessary to the use of a separate power-generating unit—such as a boiler entails—they are far more complex than the new motor cars. These latter are composed, technically speaking, of nothing but the vehicle, the "prime mover," and the transmission. The generator with its multitudinous parts ready to cause trouble, are absent. It necessarily follows, to a mechanical mind, that a gasoline motor car, properly constructed and built with the same skill and care as a locomotive, is a much less vulnerable machine than a locomotive, and will give more continuous service without failures.

There is a great demand, the superintendent added, for a passenger car that can be self-propelled and run at a low cost for operation. There are several kinds of transportation service to which the gasoline motor car is particularly well adapted, and to which it is almost a necessity. Many steam passenger trains are being operated at a financial loss, yet the passenger service must be maintained. To meet these demands the gasoline cars have been designed, and after some years of experiment, they have proved so satisfactory that a number of others are to be put into use.

The cars are entirely of steel, and have two four-wheel trucks. The driving wheels are 42 inches in diameter; other wheels 33 inches. They are fifty-five feet long, with a seating capacity varying from 57 to 75, according to the internal arrangements. With its steel sills and bracing, the steel carlines and ribs and outside shell, the new car has remarkable strength, as its structural design almost precludes the possibility of telescoping in case of accident. In spite of its strength, the total weight is only 56,000 pounds. The line of design of the body resembles that of a racing yacht, inverted, the front end of the car being tapered off into a sharp point, and the roof being rounded off from the top, presenting no flat surface to the resistance of the atmosphere. The rear is similarly rounded, avoiding the vacuum produced by square end cars. The wind resistance is thus reduced to a minimum.

The upper deck and the old style sash ventilators have been done away with, adequate circulation of air being secured by means of roof ventilators, which exhaust by suction the air from inside the car, fresh air being taken in from the front of the roof. The stuffy atmosphere so often encountered in motor cars is entirely avoided.





Acetylene gas is used for lighting, giving a powerful illuminant for the headlight. The lamps within the car are provided with opalescent panels, to soften the light. The water from the cylinder jackets of the engine is run around the sides of the car, so that in cold weather the heat is radiated to the interior. In warm weather, this water is piped to coils below the car. These two systems of coils afford an excellent system of regulating the temperature.

The car is driven with a 100 horsepower six-cylinder gasoline engine, built after special railroad patterns, designed to meet regular service requirements. It has a "make and break" spark ignition, with a primary battery to start on, and a magneto for regular running service. The cylinders are 8 x 10 inches, of the upright type, placed at right angles to the center line of car. The six cylinders are arranged and connected in opposed sets of three cylinders, resulting in three power-giving pulsations at each revolution of the crank shaft. Air is used for starting the engine.

During the tests the motor was, at times, coupled to two passenger cars—a mail car and a coach. These were successfully started and accelerated, and the motor showed itself equal to the task in all respects. The new cars have also been tried on long distance runs, from Omaha to Portland, Oregon, and Los Angeles, California, with satisfactory results. The schedule for passenger trains was easily maintained, and the grades were mounted without difficulty. In favorable places, a speed of over a mile a minute was kept up for mile after mile. The mechanism remained in perfect order, no hot bearings developing during the runs.

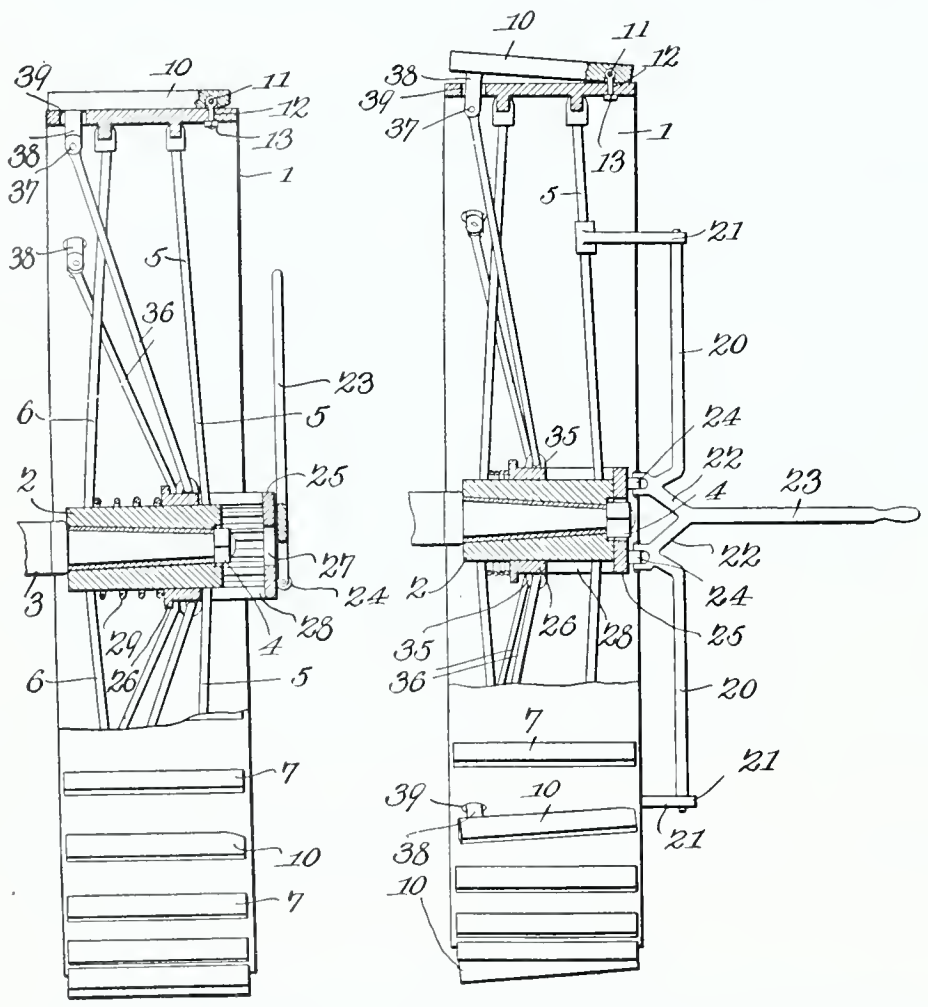
On the more recent cars, several innovations have been made. To the casual observer, the most striking is the design of the windows. Instead of being square, a sash similar to the porthole of a vessel is used—round, equipped with rubber gaskets, making it impervious to the air, water and dust. The discomfort experenced in leaning against an ordinary window on account of the cold draft in winter weather, is eliminated with this new window. But the most advantageous feature of the new design is the increased strength of the car frame permissible by means of this round aperture, the side of the car being in reality a plate girder, the depth being from the car roof to the car sill. There is also a door on the side, in the middle of the car, instead of at the end, which adds to the convenience of entrance and exit.

CLEVER NEW PATENTS.

TRACTION WHEEL.—LOCOMOTIVE VALVE GEAR.—COMBINED CHURN AND ICE CREAM FREEZER.

Traction Wheel.

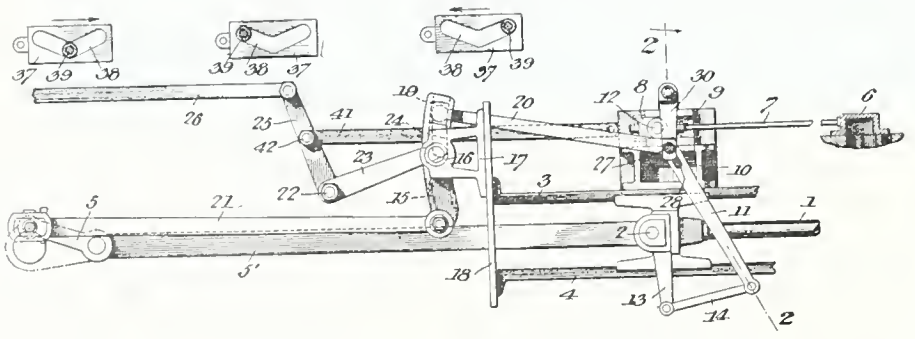
Considerable difficulty is always experienced in operating traction engines, and the like, whenever mud is encountered. To facilitate the operation under such circumstances, Mr. Matthew Wilson, of Garrison, Iowa, has invented a traction wheel, as shown in the illustration, having adjustable mud-hooks, and a novel operating mechanism for said hooks carried by the traction wheel. It will be seen that when the operating lever 23 is in the position as shown in the view to the left, the sleeve 26 is forced outward on the hub in an automatic manner by the coil spring 29, and the free or inner ends of the adjustable mud-hooks 10 are drawn inward against the rim of the traction wheel.



If it be desired to extend the adjustable mud-hooks so that they will take a deeper grip in the ground, the controlling lever 23 is grasped while the traction engine is standing still, and drawn outward to the position shown in the figure to the right, so that it is approximately parallel with the axle 3. When the controlling lever 23 is thus operated, the anti-friction rollers 24 move across the outer face or end 25 of the sleeve 26, thus forcing said sleeve inward upon the hub 2 against the tension of the coil spring 29, whereby the links 36 cause the inner ends of the mud-hooks 10 to be moved outward so as to take a firmer grip in the ground or surface over which the traction wheel is moving. The lever 23 is locked in this last position by suitably constructed means, not clearly shown in either view, but which forms part of the invention claimed.

Locomotive Valve Gear.

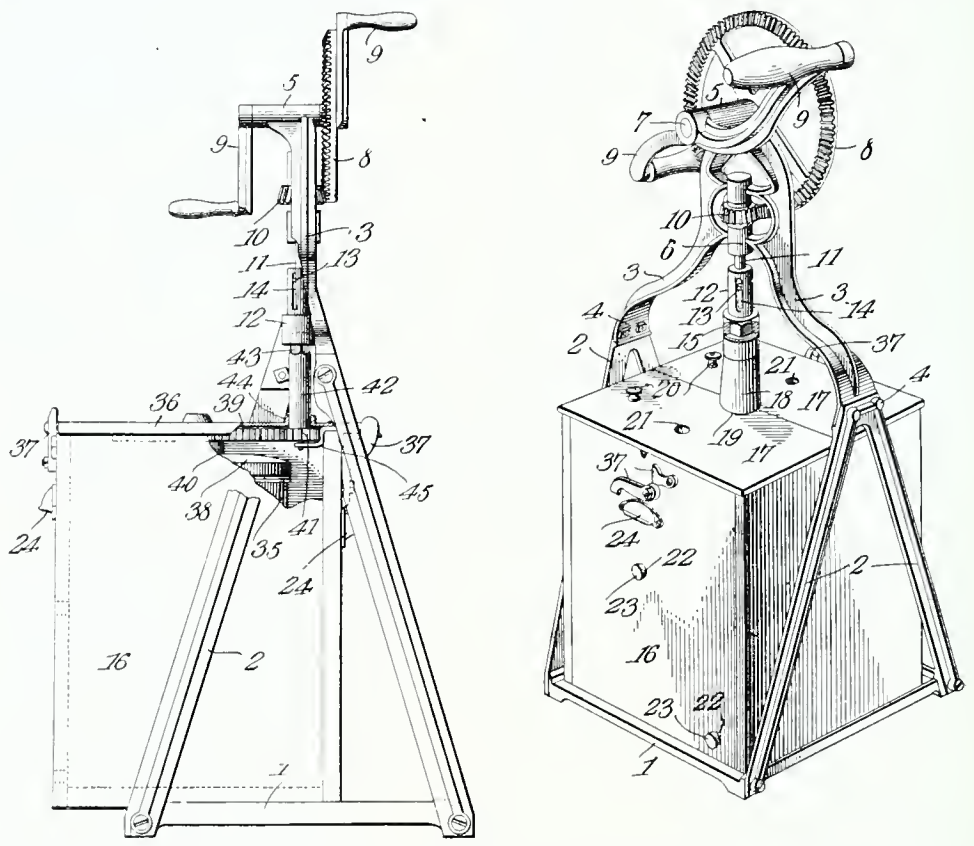
William Robert Dow, of Boulder Creek, California, has patented an improvement in valve gears. The invention is especially designed as an improvement on the Walschaert link-motion, wherein the shifting of the fulcrum of the combination lever in the direction of the movement of the slide valve to vary the lead of the valve produces too great a lead in full gear. The object is to offset this surplus lead of the valve occasioned by shifting the fulcrum



of the combination lever by the radius rod so as to obtain the desired increase in lead in full gear and also obtain the proper lead in mid-gear. To accomplish this object Mr. Dow shifts the fulcrum of the combination lever at right angles to the direction of shift occasioned by the radius rod, so as to decrease the throw of the combination lever to a predetermined extent and to counteract or offset the usual increase in lead. The ordinary and well known Walschaert link-motion to which the invention is applied is shown, but it will be noted that the combination lever 11 has a longitudinal slot 28 and the fulcrum 27 of such lever operates in the slot. This fulcrum is carried by a depending arm 30 forming a part of a bracket that is vertically slidable and has a roller 39, shown in the upper detail views, which roller rides in a V-shaped slot 38 in a reciprocating cam 37. The cam has a link connection 41 with the crank arm 25. With this construction, therefore, when the crank arm 25 is operated by the usual link 26, the cam 37 will shift one way or the other, and the roller 39 will therefore be raised or lowered. This raises or lowers the fulcrum 27, and alters the operation of the lever 11 sufficiently so that the lead is at all times properly equalized.

Combined Churn and Ice Cream Freezer.

Mr. Ira T. Babbitt, of Abingdon, Ills., has invented a new and useful apparatus adapted for use either as an ice-cream freezer or a churn, as illustrated in the accompanying views. The inventor provides a supporting frame 1, having the upright 2 and cross head 3 attached thereto for supporting the cranks 9 and the gear 8. Located on the supporting frame 1 and below the gears, is the churn body or tub 16 in which a dasher is adapted to rotate. The dasher shaft 18 extends out through the top of the body 16 and is provided with the small gear 10 which meshes with the gear 8 and thereby receives a rotary motion when the cranks are operated. In using the apparatus as a freezer, a can 38 is placed within the body 16, and ice and salt packed in the body and around the can, as shown in the left hand view. When it is desired to remove the tub 16 and discharge its contents, it is simply necessary to lift the coupling 12 so as to disengage the dasher.



By the construction shown, a simple, inexpensive and reliable combination machine is provided, that will commend itself to farmers and the general public as worthy of universal use.

PATENTS

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

CONSOLIDATED ICE CO. v. HYGEIA DISTILLED WATER CO.

(Circuit Court of Appeals, Third Circuit. February 11, 1907. 151 F. R. p. 10.)

1. TRADE-MARKS AND TRADE-NAMES—NAMES SUBJECTS OF OWNERSHIP—DESCRIPTIVE CHARACTER.

It is not necessary to the validity of a trade-mark or trade-name that it shall be utterly devoid of aptitude, but it is enough that it leaves open to every one all words that are really descriptive of quality or character.

2. SAME—"HYGEIA."

The name "Hygeia" is not used in the English language as a word of descriptive or qualifying import, but as a noun: and it may lawfully be appropriated as a trade-mark or trade-name to identify distilled water of a particular manufacturer.

3. SAME — INFRINGEMENT — LOCALITY AND SCOPE OF BUSINESS.

It is not a defense to a suit to enjoin infringement of a trade-mark that the defendant's business is confined to a single state, and that complainant, which is a foreign corporation as to such state, has not complied with its laws to qualify itself to do business therein.

4. SAME—SUIT FOR INFRINGEMENT—DEFENSES.

It is sufficient to warrant the granting of an injunction against infringement of a trade-name that defendant has used it in a manner which is likely to produce confusion as to the origin of the article to which it is applied, and it is not material that such use was without wrongful intent.

NATIONAL ENAMELING & STAMPING CO. et al. v. NEW ENGLAND ENAMELING CO.

(Circuit Court of Appeals, Second Circuit. Dec. 4, 1906. 151 F. R. p. 19.)

1. PATENTS — CONSTRUCTION OF CLAIMS—REFERENCE TO SPECIFICATION.

The claim in a patent is the measure of the invention, and, while the specification may be referred to for the purpose of explaining any ambiguity in the claim, it cannot be referred to for the purpose of expanding or changing the claim.

2. SAME — VALIDITY — ENAMELED METAL WARE.

The Claus patent, No. 527361, for an improvement in enameling metal ware, claims 4 and 6, which cover as a new article of manufacture a metallic article having a coat of enamel of "an intensely alkaline nature" and "a mottled coat of alkaline enamel," respectively, and claim 8, which covers an enamel for surfaces having "a preponderance of alkaline constituents," each closing with the words "substantially as described," are void because they do not describe or cover the invention, if any, made by the patentee, since neither the completed enamel or "dip" of claim 8, made from the ingredients and by the process decribed in the specification, nor the burned enamel on the completed article as so made are alkaline, nor do they contain a preponderance of alkaline constituents. Claims 5 and 7, covering as a new article of manufacture a steel article having a single coat of mottled enamel, and in the latter claim also metallic oxides extending from the outer surface of the enamel inwardly, are also void for lack of novelty, in view of the prior art.

HILLARD v. FISHER BOOK TYPEWRITER CO.

(Circuit Court, S. D. New York. February 9, 1907. 151 F. R. p. 34.)

1. PATENTS—INVENTION AND INFRINGEMENT—TYPEWRITER ESCAPEMENTS.

The Hillard patent, No. 580,218 for improvements in typewriter escapements, the principle of which is the utilization of the carriage-propelling power for the re-engagement of the members of the escapement and the return of the key and typebar to normal position synchronously with the feed of the carriage, was not anticipated, and discloses invention of a high order, and the claims are entitled to a broad construction as limited by the prior art and a liberal application of the doctrine of equivalents, as covering, in a limited sense, and in the particular field of the art to which they relate, a pioneer invention. Claims 30 to 35, inclusive, and 37, 38, and 41, also held infringed.

2. SAME—VALIDITY—SUFFICIENCY OF DESCRIPTION.

It is immaterial whether or not the means for accomplishing a result covered by a patent are illustrated therein, if they are sufficiently described in the specification.

3. SAME—NONUSE OF PARTS.

If a patentee shows a new result to be attained, and means which are new and novel for attaining that result, and the device indicated is operative, his patent is good, even if in subsequently applying it he varies the means employed by substituting equivalents.

PELTON WATER-WHEEL CO. v. ABNER DOBLE CO.

(Circuit Court of Appeals, Ninth Circuit. February 6, 1907. 151 F. R. p. 29.)

PATENTS—INFRINGEMENT — WATER-WHEEL BUCKETS.

The Dodd patent, No. 454,638, for a water-wheel bucket is for an improvement in form only over the buckets of the prior art, and is not for a pioneer invention. It is not infringed by the bucket of the Doble patent, No. 633,184, which differs from the Dodd invention in both function and form.

BARNES v. LINGO.

(Circuit Court, E. D. Pennsylvania. Feb. 15, 1907. 151 F. R. p. 59.)

1. PATENTS—INVENTION—CLOTHES DRYING MACHINE.

The Barnes patents, Nos. 684,776 and 684,778, for a clothes drier and a clothes drying machine, respectively—the second being for improvements on the machine of the first—cover a true combination and disclose inventiou; the devices used, while old, and each performing its old function, being so combined that, by their co-operative action, a greatly improved result is produced. Both also held infringed.

2, SAME—CONSTRUCTION OF CLAIMS.

The fact that the specification of a patent, in describing the invention, describes a device which is, in fact entirely useless so far as contributing to the result is concerned, does not restrict the claims to a combination including such device as an element where it is not mentioned therein.

SHELBY STEEL TUBE CO. v. DELAWARE SEAMLESS TUBE CO. et al.

(Circuit Court, E. D. Pennsylvania. Feb. 20, 1907. 151 F. R. p. 64.)

1. PATENTS-SUIT FOR INFRINGEMENT-PROOF OF ASSIGNMENT.

An assignment of a patent is sufficiently proved in a suit by the assignee for its infringement by the testimony of one of the subscribing witnesses, unless there is some special reason for requiring more.

2. SAME—DELIVERY.

That an assignment of a patent was recorded, and is produced and put in evidence by a subsequent assignee, in a suit for infringement, is sufficient evidence of its delivery.

3. SAME—SUFFICIENCY OF ASSIGNMENT.

A conveyance by a corporation of all of its property, including its "good will, patents, trade-marks," etc., is effective to pass title to a patent then owned by it, although not described therein.

4. SAME—UNRECORDED ASSIGNMENT.

An assignment of a patent is effective to pass title as against an alleged infringer, although not recorded.

5. SAME—INFRINGEMENT—CHANGE IN FORM.

Except where form is of the essence of the invention in a patented device, it is of little weight and a variation therefrom, while retaining the principle and mode of operation of the invention will not avoid infringement.

6. SAME.

Where the mechanism of an alleged infringing machine is substantially the same as that of the patent, the fact that for some reason, designed or otherwise, its operative effect is made to vary, cannot be altogether accepted as avoiding infringement, especially where the variance is the result of not doing all with the mechanism that might be done; its possibilities under ordinary and proper use being the test.

7. SAME—MACHINE FOR MAKING TUBING.

The Stiefel patent, No. 551,340, for a mechanical device for making metal tubing, while only for an improvement upon that of the prior art, covers an improvement of value, and was not anticipated and discloses invention; nor is it strictly limited to a construction in which a plane or flat surface of one of the disks by the action of which the tube is shaped is opposed to a beveled surface on the other. Also held infringed.

WARREN FEATHERBONE CO. v. LANDAUER et al.

(Circuit Court, E. D. Wisconsin. November 30, 1903. 151 F. R. p. 130.)

INJUNCTION—GROUNDS—CIRCULARS GIVING NOTICE OF SUIT FOR INFRINGEMENT OF TRADE-MARK.

It is within the rights of a complainant, who has commenced suit for infringement of a trade-mark and for unfair competition, to issue circulars to the trade stating such facts and its claimed rights, where such circulars are sent in good faith and the claims made are fairly within the scope of the bill, and their issuance will not be enjoined on petition of the defendant, on mere denials of the allegations of the bill, and in advance of a hearing or the taking of any evidence upon the issues of fact joined.

BRACKEN v. ROSENTHAL et al.

(Circuit Court, N. D. Illinois, E. D. January 31, 1907. 151 F. R. p. 136.)

1. COPYRIGHT-INFRINGEMENT-PHOTOGRAPHS OF SCULPTURE.

A photograph of a copyrighted piece of sculpture is a "copy" thereof, within the meaning of Rev. St. § 4952 [U. S. Comp. St. 1901, p. 3406], and, if made without authority from the proprietor of the copyright, is an infringement thereof.

2. EQUITY—PLEADING—MULTIFARIOUSNESS.

The objection of multifariousness is one addressed to the discretion of the court, and is to be determined with reference to the peculiarities of each particular case, upon considerations of practical convenience to the court and the parties, and of the saving of time and expense.

3. SAME—COPYRIGHT—SUIT FOR INFRINGEMENT.

A bill for infringement of copyrights of different pieces of sculpture will not be held demurrable for multifariousness where the parties and the general method of alleged infringement are the same, and especially where it appears from the bill that all of the acts of infringement were committed pursuant to a common purpose by the defendants.

DUNLAP v. WILLBRANDT SURGICAL MFG. CO. et al.

(Circuit Court of Appeals, Eight Circuit. November 30, 1906. 151 F. R. p. 223.)

1. PATENTS — INFRINGEMENT—ATOMIZER.

The Dunlap patent, No. 483,435, for an atomizer, claim 2, the principal feature of which is that the tube which enters the bottle is made in three separate parts, to facilitate cleaning, one of which parts is a hollow coupling uniting the other two, is not entitled to a broad construction, and, as limited by the prior art and the language of the claim, each of the three parts of the tube described is an essential element of such claim, and it is not infringed by a structure in which the tube is made in two parts directly joined together.

2. SAME—CONSTRUCTION—SCOPE OF CLAIMS.

A patentee is entitled to every function his device will perform, though he was ignorant of it when he procured his patent, but he secures no patent on the function, and the discovery of a new one in the patented device does not operate to enlarge or broaden the letter of his claim, which is the measure of his rights.

3. SAME—INFRINGEMENT—ATOMIZER.

The Dunlap patent, No. 620,895, for an atomizer or vaporizing apparatus, claims 2 and 3, are void for anticipation. Claim 8 held not infringed.

4. TRADE-MARKS AND TRADE-NAMES—UNFAIR COMPETITION—SIMILARITY IN APPEARANCE OF ARTICLES.

Evidence considered, and held to support a finding that a defendant was not chargeable with unfair competition in making, advertising, and selling an atomizer similar in appearance to complainants', which was not protected by any trade-mark or design patent, where the names given the two devices were different, and each was indelibly stamped with the name and address of the manufacturer, and there was no evidence of an intent to deceive purchasers.

CONSOLIDATED RUBBER TIRE CO. et al. v. FIRESTONE TIRE & RUBBER CO.

(Circuit Court of Appeals, Second Circuit. January 30, 1907. 151 F. R. p. 237.)

1. PATENTS—INVENTION—SUCCESS OF DEVICE.

Where a patented device has won a position of unchallenged supremacy in the commercial world, a court should endeavor to sustain the patent rather than defeat it.

2. SAME—RUBBER TIRED WHEEL.

The Grant patent, No. 554,675, for a rubber tired wheel was not anticipated and discloses invention. While the elements entering into the combination are old, such combination operates to produce a new result, or an old result in a manner which is a vast improvement over anything in the prior art. The tipping or rocking of the tire when subjected to lateral pressure is a function inherent in the combination, and the specification is so clear and explicit that no intelligent mechanic could follow it without securing such result. Also held infringed.

CAMERON SEPTIC TANK CO. v. VILLAGE OF SARATOGA SPRINGS et al.

(Circuit Court, N. D. New York. March 12, 1907. 151 F. R. p. 242.)

1. PATENTS—PROCESS—PATENTABILITY.

It is when the term "process" is used to represent the means or method of producing a result that it is patentable, and it will include all methods or means, not natures, which are not effected by mechanism or mechanical combinations.

2. SAME.

A principle is not patentable, and while there may be a valid patent for means or methods of putting principles into operation so as to produce useful results, there cannot be for nature's means and methods.

3. SAME—INVENTION—PROCESS AND APPARATUS FOR TREATING SEWAGE.

The Cameron, Commin, and Martin patent, No. 634,423, for a process of, and apparatus for, treating sewage, is void for lack of invention, in view of the prior art. The process claims for liquefying sewage by anærobic action are for an aggregation of three separate and successive processes, two of which were old, and the other a process of nature not patentable, and which had, moreover, been previously discovered and utilized by others. The apparatus claims, which cover a settling tank, a septic tank, and an aerator, disclose nothing which was not known and used in the prior art, except, perhaps, an improvement in the outlet of the septic tank, which involved no invention. Also held not infringed, even if valid, as limited by the prior art.

FRIEDBERGER-AARON MFG. CO. v. CHAPIN.

(Circuit Court, E. D. Pennsylvania. Feb. 15, 1907. 151 F. R. p. 264.)

PATENTS—INFRINGEMENT-DESIGN FOR LACE TRIMMING.

The Kerwin & McGinley design patent, No. 36,895, for trimming for ladies' underwear, held infringed.

BABCOCK & WILCOX CO. v. NORTH AMERICAN DREDGING CO.

(Circuit Court, D. New Jersey. February 7, 1907. 151 F. R. p. 265.)

1. PATENTS — CONSTRUCTION OF TERMS—"SECTIONAL STEAM-BOILERS."

In the Pratt patent, No. 439,684, and the Hoxie patent, No. 595,852, both for "sectional steam-boilers," that term is used as embracing all water-tube boilers, and not as limited to a boiler built in sections, each section being composed of a group of tubes having front and rear headers common only to the tubes of that group.

2. SAME-INFRINGEMENT-SECTIONAL STEAM-BOILERS.

The Pratt patent, No. 439,684, for a sectional steam-boiler, claim 5, when read in connection with the specification, is limited to a boiler in which there is a combination of groups of large and small tubes oppositely inclined, the large tubes being inclined from the front downwardly to the rear, while the upper, or smaller tubes, are inclined from the front upwardly to the rear, the purpose of such opposite inclination being, as stated, to "promote the reverse circulation," and such claim is not infringed by a boiler in which the tubes are all upwardly inclined.

3. SAME.

The Hoxie patent, No. 595,852, for a sectional steam-boiler, having the water tubes inclined upwardly from front to rear, and a transverse steam and water drum located at the front of the boiler in the space above said tubes, largely used for marine purposes, was not anticipated and discloses invention. Also held infringed.

4. SAME—VALIDITY—DESCRIPTION OF PRIOR ART.

If a patentee in his specification describes in appropriate language a real invention, and properly sets forth his claim to that invention, he is not to be deprived of it merely because he has inadvertently erred in his reference to the prior art.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Charles Jenkins, Delevan, N. Y. Potato Cutter and Feeder for Planters.—An object of this invention is to cut the potatoes and simultaneously feed the cut portions to the seed spout. Another object of the invention is to provide an adjustment for enabling the potatoes to be cut into pieces of the desired size, and to positively cause the severed pieces of the potatoes to fall into the discharge spout.

Henry R. Henrichs, Lamont, Okla. Breast Strap Connection.—One of the objects of the present invention is to enable the draft animals to be hitched to, and unhitched from, a vehicle or machine with greater facility than heretofore, and to prevent the breast straps from hanging around the legs of an animal and annoying it when the breast strap connection is detached from the neck yoke. Another object of the invention is to hold the tongue of a vehicle or machine steady, and to afford the necessary play or movement of the tongue without permitting the same to strike the draft animals.

Simon L. Lucas, Mullberry, Fla. Mail Crane.—An object of this invention is to enable the mail crane to be normally arranged in an inoperative or out-of-the-way position so as not to be a menace to passing trains, and also to prevent the latter from accidentally knocking a mail bag from the crane. Another object of the invention is to enable the mail crane to be readily swung into operative position by a mail car equipped with the proper operating device, and to automatically swing the mail crane to its inoperative position after the mail bag has been removed from the crane.

Joseph J. Shimek, Narka, Kansas. Convertible Heating and Cooking Stove.—One of the objects of the present invention is to enable the stove to be easily changed into either a cooking or heating stove without removing any of the parts. The invention possesses among others the following advantages: First, more than one-half the fuel is saved as compared with any heating apparatus now on the market. Second, the heat produced by this invention, for health, comfort and agreeableness, has no equal in any stove in use at the present time; there is not the slightest trace of dampness in rooms heated by the convertible stove, and through its draft it produces sufficient circulation of air to supply plenty of fresh air without opening doors or windows, and the manner in which it draws in and consumes dust, and bad odors produced from any cause, is marvelous. Third, frost adhering on the inner face of window glass will, after the heater is lighted, disappear without leaving any moisture on the glass or on the window sill. Fourth, by using the heater as a ventilator permitting the fire to gradually go out, the invention will keep more frost from the room than a fire banked in an ordinary heater. Fifth, it consumes coal, wood, straw, hay and trash of any kind that will burn at all, and ashes taken from a cook stove or from an ordinary heater, if placed in the convertible heater, will be reduced in bulk and will produce considerable heat, while for burning trash, it may be filled, tramped down and left without danger of explosion, owing to the novel arrangement of the draft. Sixth, the stove creates little or no soot and very little smoke, and thereby avoids the trouble and inconvenience of cleaning stove pipes and chimneys incident to other stoves. Seventh, by simply adjusting two slides or openings, it is converted into a cooking stove, adapted to boil and otherwise cook articles of food cheaper and in less time than the ordinary kitchen stove.

Joseph J. Shimek, Narka, Kansas. Grate for Cook Stoves.—This invention has for its object to provide means for controlling the heat, whereby more advantageous cooking is afforded and a material saving in fuel is effected. The invention is characterized by the following advantages: First, in placing the grate in an ordinary cook stove, it saves at least one-half of the fuel. Second, a cook stove equipped with the improved grate is always ready to be converted into a summer stove by simply opening the damper, which with the ordinary stove would permit all the heat to escape directly into the chimney, and increase the length of time consumed in cooking and require about four times the amount of fuel to secure the results obtained by the grate of the present invention. Third, by simply opening or closing the wickets or slides, the heat is transferred from one side of the stove to the other without changing the position of the fire inside the fire box; also by this adjustment greater heat can be secured at one side of the oven that at the other, thereby obviating the necessity of turning pans within the oven while baking. Fourth, the operator has complete control of the heat in the oven for baking; the slides of the grate enable the heat to be changed to bake perfectly either thin crackers or bread, and the grate not only completely eliminates the turning of a pan to secure even baking, but will obviate the necessity of looking into the oven from time to time to ascertain if the baking is uniform. Fifth, each product coming out of an oven equipped with the improved grate will rarely find its equal, and will never be excelled by the products of any oven or baking device on the market at the present time. Sixth, no adjustment of the grate is required to adapt it for different kinds of fuel, and in any of its adjustments it is adapted to consume any kind of fuel. Seventh, there is very little accumulation of soot and extremely few ashes.

Thomas G. Wilson, Hazel Green, Wisc. Means for Supporting Window Shades and Curtain Poles.—The object of the inventor has been to produce a very simple article of manufacture, which can be constructed of a single piece of wire, and will constitute a support for a curtain pole and shade roller. The device comprises an outstanding upper shank having spaced upstanding double fingers with a curved portion between, forming a pole-receiving socket. The outer finger is longer than the inner finger and has an outer arm curved against, and extending below, the same. This arm has a depending portion, to which is connected a lower shank arranged parallel to the upper shank, and having a downwardly extending loop in which the gudgeon of the shade roller is engaged. The upper shank has a threaded terminal, while the lower shank has an offset eye at its inner end to receive a screw or other fastener.

Olaf Pearson, Escanaba, Michigan. Work Holding Means.—This invention relates to means for holding work upon carpenters' benches, and comprises a pair of separate clamping members that can be secured to any work bench so as to hold a number of pieces of timber either flat upon the bench or on edge. For this purpose, the members are provided with vertical portions and horizontal portions, the latter resting on the table top, the former being suspended beside the front of the table. One of the horizontal portions comprises a clamp that engages the edges of the table, and both of these horizontal portions or sections have work-clamping dogs. Work holding means are slidably mounted on the holding portions, and are held in adjusted positions by suitable dogs and racks. One of these clamps is provided with a stop; the other has a screw threaded therethrough, provided with a clamping head.

James W. Ross, Spencer, Nebr. Means for Releasing and Leading Animals from Stables.—In case of fires in stables, many horses unnecessarily perish because in the confusion they cannot be, or are not, led from the same. Mr. Ross has devised a simple mechanism whereby the animals may be released and led from a stable without the operator going inside, and without his having to manipulate any intricate mechanism. In the stalls are placed halter cables or straps, which are secured by locking bolts, the same engaging in rings fastened to the ends of the halter straps or cables. Leading cables pass through the rings and are detachably connected by suitable mechanism to the bolts. These cables are slidably engaged with carriages that operate on an overhead track in rear of the stalls, the ends of the cables being connected by links that extend to the ends of the stable at the doors. The mechanism is so arranged that in case of fire, a person has only to go to either door and draw upon the end of the links, whereupon all the bolts will be withdrawn from the halter cable rings, thus releasing the same. Upon a further pull, the leading cables are disengaged from the bolts, the animals are turned in the stalls and drawn outwardly, and then are readily directed from the stable by continuously pulling on the links. It will thus be evident that by the single pulling operation, the animals are released and led from the stable.

William I. Dreisbach, of Williamsport, Pa. has secured two patents.—The first relates more particularly to pneumatic tires for automobiles and like vehicles, and the principal object is to produce a tire that can be cheaply manufactured, is light and resilient and has great powers for resisting the passage of articles, such as nails, and the like, that are apt to puncture the air tube and permit the escape of air. It consists in the combination with an outer casing, of a puncture resisting cushion located inside the same and comprising a plurality of independent layers of fabric, one laid on the other, and having their margins only secured together at intervals, the portions between said fastened parts being free from one another.

The second patent covers a garment fastener adapted to secure the meeting edges of a garment, and designed more particularly as a corset clasp, although capable of general use as a garment fastener, as for instance in connection with gloves, skirt plackets, trouser waist bands, etc. A plate is formed with a depression and with a retaining part bent back from the plate toward the bottom of the depression to produce a constricted interval, and a co-operating member substantially corresponding with the depression is adapted to be drawn under the retaining part by a separative movement of the members and thus clamped between said part and the bottom of the depression. Romeyn L. Smith, of New Brunswick, N. J. is the assignee of one-half of this second patent.

Two patents, one for a molding machine and the other for a building block, have been granted to David A. Schoeneman, of George, Iowa.—The first patent has for its principal object to provide novel, efficient, and simple means whereby building blocks, having openings therethrough for the circulation of air, may be readily produced with rapidity and at small cost. It consists of a support, side walls movably mounted thereon, a stationary core member mounted on the support between the side walls, another core member movably associated with the stationary member, means for moving the movable member, and a pallet removably mounted on the support, said pallet being independent of the side walls and removably associated with the core members.

The aim of the second invention is to provide novel blocks which can be readily manufactured by the aforesaid machine and are comparatively light in weight and economical in the amount of material employed, and which, when built into the wall, will form therein channels and passageways for the circulation or confinement of air. The building block has a body comprising an intermediate, longitudinal, central channel terminating short of the sides thereof, leaving thicker portions on its opposite sides, and a plurality of rows of transverse openings extending through the thicker portions of the body on opposite sides of the longitudinal channel, said openings being disposed in staggered relation and communicating with the opposite side portions of the channel, and said openings furthermore being of less diameter than the web portions of the body that are formed between them.

An ingenious pipe dressing tool has been patented by William Ritschard, a resident of New York City.—It is the aim of this inventor to provide a simple implement by means of which the end of a pipe can be accurately and concentrically tapered, and such tapered end will have a smooth surface in order that a successful joint may be obtained, the implement being furthermore so constructed that it may be successfully employed on pipes of different sizes. The invention comprises a body, a journal stem carried thereby and comprising a core, a bushing mounted on the core, a screw connecting the outer ends of the core and bushing to hold the same against relative longitudinal movement, the body and bushing being provided, one with a key, and the other with a socket that receives the key, to hold the bushing against rotary movement on the core, and a cutter carried by the body and disposed at an inclination to the core.

An ingenious Trolley Wheel has been patented by Martin L. Amann, Warren, Pa. One-half interest therein has been assigned to Charles Amann of the same place.—It is the aim of Mr. Martin to produce a self-lubricating anti-frictional wheel of simple, durable and efficient construction, and capable of being mounted in any trolley harp of standard make or design. The wheel comprises inner and outer independently rotatable members, the inner member including an inner bearing sleeve and a sectional outer bearing sleeve, one section of the outer bearing sleeve being rigid with the inner sleeve, and the other section of the outer sleeve being adjustable on the inner sleeve.

John Beach, Harwood Mines, Pa. Portable Elevator.—One of the objects of this invention is to provide a traveling or portable elevator, designed for handling various loose materials in bulk, and adapted to rapidly elevate the same from a bank or pile for loading cars or wagons, or for delivering the material to a conveyer line or other place. Another object of the invention is to equip the elevator with means for either moving it backward or forward to advance it into the material to be elevated, or for operating a plurality of endless conveyers to carry the material upward.

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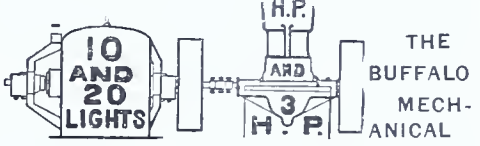
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WASHINGTON, D. C., MAY 1, 1908.

Salaries of Patent Office Examiners.

The determined effort that has for years been made before Congress to provide an increase and a readjustment of the salaries of the officials of the Patent Office, appears at last to have been successful. Since our legislators recently voted themselves an increase in their own salaries, it was obvious that they could not refuse this act of justice to a corps of highly educated, hard-working and efficient employees. The salaries of the Patent Office examiners are the same as they were fifty years ago, and are manifestly inadequate to the enormous development of the work.

It is to be trusted that this well-earned increase in compensation will help to solve a serious problem with which the Patent Office is confronted. More examiners left the Patent Office last year to go into private employment than ever before. Many of the most skillful and experienced officials were lost in this way. It takes years for an examiner to become properly trained, and just about the time that the Government has begun to profit by his efficiency, along comes an offer of better remuneration from an attorney or a manufacturer on the outside. and a resignation follows. The examiners are all graduates of colleges, mostly polytechnic colleges, and 90 per cent of them have taken courses in general and patent law, and, with Office experience, are invaluable to the service; but it has become a common practice for them, after a period of about three years in the Office, to resign and accept lucrative positions on the outside. In this way, as the Commissioner has pointed out, the Patent Office has become merely a post-graduate school for the technical and legal education of young college men who enter the service. The General Electric Company alone has, in its employment, twelve or more men who were formerly examiners in the Patent Office. Hundreds have gone into other corporations, so that the Office has been placed in the humiliating position of competing with outside institutions for men to do its technical work. We hope that the more adequate compensation now provided will go far toward ameliorating these conditions.

A Building for the Patent Office.

The question of providing adequate accommodation for the Patent Office, comes up before each Congress. In the absence of suitable provision on the part of our law-makers, it is becoming more and more urgent with the continued growth of the business. Notwithstanding the fact that the Land Office has been moved over to the old Post Office Department building, thus increasing the space allotted to the Patent Office, there is still a crying need for more room, and the work is being seriously hampered for the lack of it. The increase of the records, year after year, in the shape of copies of patents, files, books, etc., taxes the ingenuity of the authorities to find space. Many of them are, perforce, tucked in out of the way corners, and much time is lost by the officials when it is desired to refer to them in hunting them up. When it is considered that the weekly issue of copies of patents consists of an average of 100 copies each of 700 patents, and that each issue requires 200 linear feet of space, it will be seen that the need of immediate relief is imperative. It is out of the question to add more stories to the present building, as it would destroy its architectural appearance. Greek art cannot be made adaptable to the lines of the modern sky-scraper. If all the other bureaus of the Interior Department were removed, there would still be insufficient room for the Patent Office. Various expedients have been suggested, such as the building of additional rooms between the floors of the third story, which have high ceilings, and the roof. The basement could also be cut down so as to afford more space, and rooms for storage of records could be provided under the side-walks. But what the Patent Office should have is a building constructed with sole reference to its special needs and requirements. It should have a testing room and laboratory as an adjunct to its work, and should be large enough to allow for the natural growth of this department. The Patent Office is the only revenue-producing bureau of the Government, and it is a shame that the present intolerable conditions should be allowed to continue. If some of the millions of dollars in patent fees deposited yearly in the U. S. Treasury were devoted to this purpose, a magnificient building could be provided which would be a credit to the Nation and a monument to the inventive genius which is so characteristic a feature of American life.

Unfair Competition.

The doctrine of unfair competition has been invoked in a number of patent cases before the courts in recent years. As a result attorneys have not been lax in citing new instances for the enforcement of this doctrine. The tendency of the courts, however, seems to be against any considerable enlargement of the application of this rule of law. It was started by a case arising in one of the Pennsylvania Circuit Courts in which the manufacturer of a coffee mill, the patents on which had long since expired, sought to enjoin another manufacturer from making a mill, using the same style and shape of castings, and the same color of paint and decorations. The complainant alleged that by reason of the acts of defendant, his own customers had been induced to purchase mills from the defendant, believing that they were the product of complainant. No question of infringement was involved, but it was simply a matter of protecting the public and incidentally conserving the interests of the complainant. Evidence being produced that the customers of the complainant had been deceived and misled, the court held that a case of unfair competition had been shown and the defendant was enjoined. There have been instances in other circuits where the same rule has been applied to hold a defendant from committing such unlawful acts, and it is believed that while the proposition is a novel one in patent cases, it is becoming part of the practice of the courts. While there is apparently no disposition to enlarge the application of the doctrine, yet wherever it is shown that a defendant, in preparing or dressing his goods for the market, has sought to imitate the goods of another so that the customers of the latter are deceived, the courts will step in and put a stop to the reprehensible practice. This is done in the interests of the public and for the protection of the rights of the complainants.

The New Order of the Patent Office.

A few weeks ago there appeared in the Official Gazette the following order made a part of rule 22 of the Patent Office Practice:

> The Secretary of the Interior may, after notice and opportunity for a hearing, suspend or exclude from further practice before the Patent Office any person, firm, corporation, or association shown to be incompetent or disreputable, or who refuses to comply with the rules and regulations thereof, or who shall, with intent to defraud in any manner, deceive, mislead or threaten any claimant or prospective claimant, by word, circular, letter or by advertisement, or by guaranteeing therein the successful prosecution of any application for patent or the procurement of any patent, or which word, circular, letter or advertisement shall contain therein any false promise or misleading representation.

We have nothing but commendation for this order, for if impartially administered, and strictly enforced, the order would mean much for the betterment of the practice before the Patent Office, and aid in protecting the interests of inventors. If the order was made and published, with a view of its impartial and strict enforcement, we hail its advent as an augur of a better condition of affairs in the future, so far as inventors and attorneys are concerned. No honest attorney can raise any objection to the necessity for, or the utility of, the order in question. No honest attorney should be affected by the order. It should be the pride of every attorney that his practice has always been within the terms of the order, and that the promulgation of the latter will not necessitate any change in his circulars, advertisements, or practice. If, however, the order is not to be enforced strictly, but was published as a bluff, or merely to scare certain attorneys into doing right, then it is unfortunate that the order was published at all. No law, ordinance, or rule should be passed or issued by any legislature, council or administrative officer which is not intended to be enforced; for its non-enforcement tends to bring the law itself into disrepute.

That there is a need for this order and an urgent necessity for its enforcement, is shown by a consideration of the advertisments and circulars issued by those whose practice before the Patent Office is the largest. Indeed, the chief offenders are the ones whose advertisements may be found in nearly every paper and magazine. One would think that the scoring which was given to John Wedderburn & Co., when disbared from practice about ten years ago, would have sufficed for a generation and prevented any self-respecting attorney from sending out "Lists of Inventions Wanted" or advertising, as some attorneys have done, "One million dollars offered for one invention, $100,000 for another;" thus leading inventors to think that it is only necessary to think of some foolish thing, and secure a patent on it, to claim the fortune. We cannot too strongly impress on our readers that such advertisements are false, and the attorneys who publish them to secure business, are not the ones to be entrusted with a really valuable invention. The more we see of patents, the more we are convinced that instead of being a passport to fortune, they are a speculation with the chances against the inventor nine out of ten. We are speaking now of the class of inventors who enter the field of invention with no well-defined knowledge of the wants of the public, but who have been led into inventing something by the information that a metallic railroad tie was needed, or that a nut lock was what the railroads were hunting for, or that a non-refillable bottle was demanded by every manufacturer who puts up a brand of whiskey. An inventor receiving such information, immediately starts to work thinking of some novel improvement along the lines mentioned, and without any information of what has already been patented, or any knowledge as to what is already in use, devises a specific improvement which has possibly one novel point in it, and sends his application to the attorney who has informed him through the misleading "lists of inventions wanted" that such a device is really in demand. The inventor secures the patent with possibly a single specific claim, and

then looks for the fortune which he has been led to believe is awaiting him. Of course the money is not forthcoming, but he has the blue ribbon and red seal from the Patent Office, and the community in which he lives hails him as an inventor!

The remedy for this is clearly within the power of the Patent Office. Such alluring and misleading advertisements should be stopped. It should be made clear to the attorneys who send out "lists of inventions wanted" that a continuance of such practice will incur the displeasure of the Patent Office, and if persisted in, will bring about the disbarment of the attorneys. Those attorneys who make it a practice to file applications for patents on notoriously unpatentable inventions, should be investigated. The men who do this usually get their fees in advance. There are also some attorneys who offer to make free examinations, but never go near the Patent Office. Such attorneys should be disbarred without the expense of a trial.

The chief offenders are located in the city of Washington. They are personally known to the officials of the Patent Office. In nearly every case they are men who are not members of the bar, and have never received the inspiration through the study of the principles of law and equity. They are men who have drifted into the patent business because of a consideration of the commercial side only, and without any clearly defined ideas of professional ethics. The duty of the Patent Office is clear. Armed with this new provision of the rules, there should be an impartial and strict enforcement thereof to the end that the unsavory odor that clings to the name of a patent attorney, should no longer exist, and the business of a patent solicitor be raised to the high standard which it should occupy among the professions. There is no branch of the law which requires more varied accomplishments and greater learning than that of a patent lawyer, and yet we find that through the improper methods of a comparatively few attorneys, the business has been reduced to a low plane. A strict enforcement of the new rule would help inventors, the better class of attorneys, and redound to the glory of the Patent Office.

To Prevent Punctures of Tires.

A composition has been discovered for the prevention of puncture of pneumatic tires on automobiles, bicycles, etc., and if it does all that is claimed for it, it well deserves its name—miraculum. The preparation is described as a semi-liquid substance, similar in color and thickness to cream. It is injected in a cold condition through the valve into the inner tube of a pneumatic tire. The revolution of the wheel spreads the compound on the inside of the tire, so that if the tire is punctured it exudes through the hole, and coming in contact with the atmosphere, congeals, completely filling the hole.

It is said that in a motor tire treated with this composition, a 6-inch nail was driven to the depth of several inches, and then withdrawn. The car was sent on a short journey, and on returning, the punctured tire was found to be quite hard. It is asserted that there is no loss of resiliance by the use of this compound, and that it has a preservative effect on rubber. It does, not, however, prevent a hole or tear in the tube from being repaired by vulcanization in the usual way.

White Cement.

Numerous experiments have been made in the last few years in connection with the manufacture of white cement. The common Portland cement, although an excellent building material, has a drawback in its dull grey color, which renders it undesirable for artistic work. Plaster of Paris and magnesia cements have been used to some extent, but the former is not weatherproof and the latter is not very reliable. A white stone has been found in the Berkshire hills, however, which is said to be well adapted for use in cement, the resultant product being impervious to water and having great tensile strength.

A Cotton Seed Separator.

A far reaching discovery in connection with cotton growing has recently been made public by the Department of Agriculture. It is a cheap and simple scheme of seed selection, that in experiments already tried has increased the yield of the crop about 10 per cent. As the value of the total cotton crop, including lint and seed, is not less than $750,000,000 every year, it will be seen that this would amount to a large sum if it were adopted throughout the entire cotton belt.

For the benefit of those not familiar with cotton culture, it may be explained that it is a very difficult matter to handle cotton seed. The seed are about the size of a beech nut, but covered with a coating of fuzz that, except in the case of sea island cotton, is practically impossible to remove. The result is that a handful of seed sticks together and it is only with difficulty that they can be planted with a drill. In fact they cannot be planted with an ordinary drill at all, but require what is known as a "force feed" drill, and even then there is a heavy waste in planting. Many more seed are planted than is necessary, and the plants have to be thinned out, which means labor, and, as has been discovered, the chances are in favor of thinning out the best plants and leaving the worst. When it is considered that cotton seed costs $3 a bushel, this expense is seen to be an important factor in setting out a crop.

By the new method, the seeds are passed through a process that leaves them smooth. The cost for material in this method is only about a cent a bushel, and for labor not so much. The work, also, can be done in winter when labor is plentiful, which is another advantage. The process leaves the seed in condition to be planted with an ordinary gravity feed drill, and allows them to be set into hills that can be cultivated both ways, saving the necessity of thinning, saving the waste of seed and consequently the cost of setting out the crop. The process does not injure the seed and the light ones that are rejected for planting can be used afterwards for making oil and cotton seed cake for cattle feed. The seed, after they are dry, can be kept a year before planting, if necessary.

The smoothing of the seed, however, is only preliminary. The real advantage lies in the fact that the clean seed can be separated just as has been found profitable in tobacco growing, and by much the same method. Of course, the seeds are larger than tobacco seed, and a bigger apparatus is necessary. It consists of a hopper into which the seeds are thrown. They fall on a coarse screen, much like the "rattler" in a rock crusher. The lumps of lint and big pieces of foreign matter are carried down the screen and run out through a small trough at the end. The seeds fall through the screen upon a second and finer screen, that is just too close to let the cotton seed through, but lets out the dirt. The clean seeds run down the inclined screen and fall into the bottom of a a long wooden chimney, through which is forced a blast of air from a rotary fan. It works on the same principle as the tobacco seed separator. The seeds are all churned up by the air blast. The fat, heavy ones go just so far up the flue and fall over a riffle board and out into a sack; but the lighter and defective seeds, according to the strength of the blast, are carried up and blown out of the top of the chimney, where they are caught and saved to make oil cake. The whole process is about as cheap and simple as could be imagined, and the wonder is that it has never before been devised. The separating machines can be cheaply made; in fact, could be made on most of the plantations; and as they will be patented by the government, will cost the maker nothing for royalty.

Novel Building Materials.

Many materials are used in Europe in the construction of houses that are quite unknown in this country. Slag and cinders seem most unpromising substances, and yet, in connection with other ingredients, they find wide application on the other side of the Atlantic. In such thickly settled countries as those of the Old World, the supply of stone by no means suffices for the demand: and wood is not permitted in the cities. For these reasons, and also because of its cheapness, some artificial composition is generally employed. Concrete is popular, but there are cheaper substitutes that answer the purpose excellently. One of these compositions is made of the slag of blast furnaces or of volcanic scoria, according to the locality in which these materials are most readily found. The slag is pulverized and mixed with cement in the proportion of 400 pounds of cement to a cubic yard of slag. The usual method of mixing is combined with that of grinding the slag in a large circular trough, around which travel two heavy stone disks driven by steam, water or horse power. The cement and slag, after having been thoroughly ground and mixed, are withdrawn from the mill, mixed with water to the proper consistency, and used at once for walls of houses, or of enclosures.

In another composition, the slag is crushed and then mixed with cement and lime. Water is added, and the mixture is placed in special molds and subjected to heavy pressure. Blocks of various sizes are made, the most common measuring 9 inches in length, 2¼ in height, and 4½ in width, though some are 20 by 8 by 10 inches. These blocks are most durable, and present a pleasing appearance.

"Beton" is the name given to another substance which resembles concrete, but is easier to work and less expensive. It is made by mixing mortar and stones, gravel or cinders. Lime is weighed out to the cubic unit of sand, and the two are dry mixed. Water is added slowly with a sprinkler, and the plastic consistency tested by forming a ball with the hand, which should exude a slight moisture, and being laid aside should neither flatten nor crack open. A mortar of 1000 pounds of lime to a cubic yard of sand mixed and beaten dry, has more resistance than an equal quantity of pure lime. A house-building mortar contains from 440 to 550 pounds of lime per cubic yard. This is sufficient also for small arches and viaducts. For tunnels, foundations and viaducts of considerable height, the proportion of lime is increased.

Cinders, coke and furnace slag may be substituted for gravel in ordinary wall work. The proportions are usually two parts of stone for one of mortar for work under water; in open air work, the proportion of stone may be increased. For the latter, a mold is built, into which the beton is poured in horizontal layers from 8 to 12 inches thick, and then rammed.

Buildings several stories high are constructed of cinder beton. Sometimes the cinders are worked into blocks and laid up like cut stone. In all cases the cinders are screened and then mixed at the rate of 1 cubic yard of cinders to one-half cubic yard of hydraulic mortar, composed of 440 pounds of hydraulic lime to 35 cubic feet of sand.

Striking economies are effected by the free use of lime where cement is used in the United States. If the work be carefully performed, hardly more lime is needed than if cement were used. The beton is most durable, many ancient houses having been constructed of it and remaining in good preservation. In Marseilles, masonry of this kind is used in the sea walls and docks, a most difficult test of building material. Buildings of this substance are given a finish that loses little by comparison with cut stone, and effectually prevents the absorption of moisture.

Shingles of Asbestos.

Shingles are now made from asbestos fiber and Portland cement. They are manufactured under enormous pressure, and absorb, when fresh, only about five per cent of their weight of water. After exposure to the atmosphere for a year or more, hydration and subsequent crystallization convert them into impermeable roof coverings.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies $1.50.—Please give correct data in ordering.—Address,

THE INVENTIVE AGE PUBLISHING CO., 918 F St., N. W., Washington, D. C.

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Street-cleaning machine.....O. Neukirch
Street or roadway structure.....N. Lafon
Striper.....J. F. Thomas
Surgical pad.....J. A. Murray
Sweetmeat, such as chocolate, Manufacture of..V. Hain
Swing, Seesaw and rotary.....I. S. Woodward
Syringe.....J. Wilson
Tap and bush for beer-kegs.....H. J. Sandell
Target-trap.....G. Nicolai
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Telephone-alarm, Automatic.....M. L. Murdock et al
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Temperature regulation.....A. R. Sprague
Throttle-operator, Automatic....A. S. Anderson
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Tire attachment.....E. Collins
Tire-cover.....W. A. Allen. (Reissue.)
Tire cover, Pneumatic-.....C. A. Brophy
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Tobacco-reservoir and cigarette-filler, Combined.....H. D. Bonnell
Tools, Overhead suspending mechanism for motor-driven.....C. T. and E. E. Wilt
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Track-sweeper.....J. E. Kelley
Transmitter.....S. W. Rothermel
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Trimming and skiving machines, Feed-guide for.....C. S. Pierce
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Trunk.....C. T. and E. E. Wilt
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Type-writer tabulator.....W. R. Fox
Type-writers, Power-driving mechanism for computing.....E. B. Cram
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Umbrellas and the like, Attachment for.....W. A. Swaren
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Valve for instantaneous water-heaters, Water-.....E. Ruud
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Vehicle running-gear, Motor-driven-.....R. P. Hicks
Vehicle running-gear or suspension-frame.....R. Herman
Vehicle shock-absorbing device....L. C. Welch
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Vehicles, Means for preventing side slip of motor-.....T. B. Heathorn
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Water-heater.....F. P. Obenauer
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Well packer, Deep-.....C. M. Heeter
Wells, Tube-hoisting appliance for oil-.....J. Hogue
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Wire-suspending device.....H. E. Stevens
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Emblem.....F. A. Miller
Fabric, Pile.....S. Blumenthal
Hammock.....I. E. Palmer
Hand-bag.....H. Grossman
Music-testing machines, Casting for.....A. A. Brodeur
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Boat-detacher.....E. H. Lindman
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Can cooling or refrigerating attachment, Milk.....H. S. Parker
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Cane-mill feeder, Sugar.....J. M. Stee
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Gar guard-rail, Passenger.....J. J. Peterson
Car load-indicator, Railway.....M. C. Coates
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Car-stake.....J. Felkey
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Clevis.....H. S. Burnett
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Electrode for electrical bleaching apparatus, Carbon.....P. Schoop
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Scissors and shears.....E. Hunold
Scraper and grader.....O. E. Penwell
Scraper, Box.....J. Lobmiller
Scraper, Excavating.....J. G. Fairbanks
Screen-fastener, Adjustable metallic.....L. K. Devlin
Screen-hanger.....E. G. Rust
Seal, Envelop.....W. R. Oneal
Seal-lock.....C. S. Smith
Seals, &c., Fastening-wire for.....T. E. Murray
Sealing fruit-cans and other receptacles, Device for.....A. M. Butler
Separating-machinc.....W. A. Trescott
Sewage-disposal apparatus.....J. H. Kinealy
Sewer-cap, Artificial-stone.....E. F. Kennelly
Sewing-machine.....H. E. La Plant
Sewing-machine trimming mechanism.....G. Scott
Shade-bracket.....C. E. Waldorf
Shears.....P. Broadbooks
Shears, Discharge mechanism for.....A. R. McArthur
Shipping case, Banana.....C. A. Wellman
Ships, Distance and course recorder for.....W. C. Forbes
Shoe, Welt.....A. J. Gabrielian
Show-case.....A. D. Resler
Shuttle-binder.....A. Tilch
Signal-blade clasp.....H. C. Williams
Signaling system.....B. Staub
Signaling system.....E. E. Kleinschmidt
Skate, Convertible.....F. Graffenberger
Skate, Roller.....J. Miner
Skate, Roller.....C. Rosenrebg
Skylight.....J. N. Grenier
Slotting-machine.....W. Favreau
Small-arm, Drop-down.....W. Baker
Smoke-purifier.....G. Morby
Snap-fastener.....W. S. Richardson
Soldering-iron holder.....J. M. Fell
Speaking-tube.....F. M. Chandler
Speed-mechanism, Variable.....B. D. Stevens
Spoke-extractor.....J. W. Gay
Sprinkling and fire-alarm system, Automatic.....C. A. Jacoby
Stalls, Sanitary floor for animal.....A. Turney
Stannic oxid, Apparatus for making.....H. Foersterling
Steam-engine.....W. H. Betts
Steam-generator.....J. M. Clark
Steaming and pressing machine, Clothes.....G. E. Tarbox
Stentering-machine clip.....A. A. Whitley
Stitch-separating machine.....J. B. Hadaway
Stoker, Automatic, 2 pats.....M. B. Brewster
Stove, Alcohol.....A. W. Swanberg
Sugar, Crystallizing.....H. C. Christianson
Sulfid, Treatment of complex.....G. de Bechi
Superheater.....J. M. McClellon
Swingletree or neck-yoke hook.....J. L. Hecht
Switch-operating rod.....W. W. Johnston
Syringe.....F. C. Barnes
Tags beneath the skin of animals, Instrument for Inserting.....P. K. Dobyns
Tamper.....H. B. Johnson
Tank.....F. B. Wentworth
Tanning liquors, Utilizing sapped.....G. W. Childs
Tap-holder, Thoroughfare.....H. Heynau
Taps and chucks, Safety connection for.....J. Hosking
Telegraphic or secret codes, Tabulated gage for.....B. McNeill
Telephone dictating system or apparatus.....J. W. Kelly, Jr.
Telephone system.....E. J. Burke
Telephone toll apparatus.....E. P. Baird
Testing apparatus.....J. M. von Hassel
Testing apparatus.....W. I. Ballentine
Throttle-controller.....O. Thum
Tie-cutting machine.....C. C. Tate
Tightener.....J. M. Evans
Tire-manufacturing apparatus, Pneumatic.....T. Sloper
Tires, Spring-cushion for automobile.....J. P. Parsons et al

Tire, Non-puncturable inner....B. F. Schirmer
Tobacco-stemming machine....C. H. and H. E. Andrew
Tongue support, Vehicle-....G. F. Bell
Tongue-switch....V. Angerer
Tool-post....H. P. Wilhelm et al
Toy....J. T. Curtis
Toy....J. W. Haslett
Toy, Dancing....R. J. Tanner
Toy flagstaff....F. W. Kline
Toy oil-well....C. and J. Weisenbach
Transformer-furnace....A. R. Lindbald et al
Transformer, High-potential..C. H. Thordarson
Transom-lifter....C. C. Hall
Tread-surface....R. G. Chase
Trestle....W. H. Hazzard
Trolley mechanism....W. J. Craig
Trolley-pole....H. Bouchard
Trolley-wire finder....F. Gundorph
Truck....S. P. Knut
Truck, Car-....F. C. Stevens
Truss....M. W. Milligan
Truss, Hernial....F. Meine
Tube-drawing apparatus, Hard-metal-....B. F. McTear
Tube-joint for metal tracker-bars and forming the same....T. Danquard
Tubular bodies, Testing....E. L. Perry
Turbine, Elastic-fluid....G. Westinghouse
Twine-holder....G. C. Stevens
Type compositions on curved lines, Means for setting....H. M. Frysinger et al
Type, Guide-plate for correction-....J. A. G. Harton
Type-writer base-board, Screwless....F. S. Merrow
Type-writing machine....H. H. Steele
Type-writing-machine ribbon mechanism, Front-strike....W. R. Fox
Umbrellas, Repair-tip for....L. M. Hoyt
Uranium and vanadium from ores, Extracting..H. Fleck et al
Valve....J. J. Cook
Valve, Balanced....L. J. Rigsby
Valve, Engine-reversing....J. G. Fairbanks
Valve, Gas-engine....J. I. Thompson
Valve, Gate....J. P. Ladd
Valve, Hydrant and hose cut-off..F. S. Seagrave
Valve, Hydrant cut-off....F. S. Seagrave
Valve mechanism for engines and compressors..S. A. Reeve
Valve mechanism for gas-engines....H. Stoltenberg
Valve, Water-jacketed controlling and check....F. Peulecke
Variable-clearance engine....S. A. Reeve
Vehicle....H. S. Hele-Shaw
Vehicle-gear....S. N. Birdsall
Vehicle, Motor-....G. G. Schroeder
Vehicle, Motor-....C. L. Redfield
Vehicle or wagon brake....F. A. Grace
Vehicle-spring....L. C. Haynes
Vehicle-top....J. Rogers
Vehicle, Traction-....R. E. Zager
Vehicle-wheel....M. L. Porter
Vehicles, Foot-rest or guard for....L. W. Grout
Vending-machines, Coin-operated mechanism for....L. A. Vandiver
Veneer-machine....H. T. Williams
Vibrator....H. Larsen
Wafers, sugar-wafer biscuits, and the like, Machinery for making cups, 2 pats....T. O. Bates
Waffle-iron....W. E. Wolters
Wagon, Dump-....F. Hayes
Wagon grain-board....E. M. Anderson
Wagon-wheel....W. C. Brigham
Watch-bezel....G. G. Lloyd
Water and steam and for extracting oil and grease, Apparatus for purifying....A. E. Krause
Water in reservoirs containing aquatic animals, Regenerating....G. Erlwein et al
Water-motor....F. J. Humphrey
Water trap and seal....E. A. and F. M. Conrad
Watering-can....W. Gray
Web-guide, Adjustable....H. F. Bechman
Weighing apparatus, Electromagnetic....C. L. Bond
Well-curb....J. F. Syze
Well strainer, Oil and water....H. R. Decker
Wheel-fork....A. Kormil et al
Whip....W. E. Wright
Winding-machine stop-motion and regulator....T. Wright
Windmill....A. F. George
Window-box support....L. G. Quackenboss
Window-catch, Safety....L. D. Way
Window-frame, Weatherproof...W. S. Brickell
Window-ventilator....G. W. Kennedy
Wire-stretcher....J. H. Williams
Wire-stretching tool....T. A. Scott et al
Wooden structures, Hollow built-up material for....J. Hoellig et al
Wrapping-machine feeding mechanism....A. M. Price
Wrapping-sheet....J. W. Lambert
Wrench....C. Manning
Writing a plurality of signatures or inscriptions, Means for....W. R. Woodward

DESIGNS.

Billiard-table....J. J. Pearson
Braid and braid neckwear....A. H. Grossenbach
Button, Campaign-....C. F. Pearson
Comb....F. W. Grell
Display-stand and hanger....H. A. Richardson
Inkstand....F. M. Ashley
Pin or button head....D. P. Berry
Trimming....W. Helbig
Vehicles, Combined handle and robe-holder for..H. Thomasma et al

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MECHANICAL PATENTS.

Abrasive tool and mounting....R. A. Rowland et al
Advertising-machine....E. Pickel
Aeroplane....G. Whitehead
Air, Apparatus for the liquefaction of....G. Claude
Air-brake attachment and tripping mechanism therefor....G. P. Hanks
Air-brake valve, Safety...T. Behan. (Reissue.)
Air-compressor....J. Sturgess
Air-motor....L. B. Doman
Air-ship....J. W. Montgomery
Album, Autograph-....H. A. Stiles
Alternator, Self-excited..E. F. W. Alexanderson
Amusement apparatus....W. H. Vance
Amusement device....C. B. Post
Amusement device....W. S. Van Sant
Anchor....R. W. Buckley, Jr.
Animals, Excrement-sack for domestic....E. A. Whitehouse
Augers, Cup attachment for....W., G., and E. Hagstrom
Automobile running-gear....C. C. Keyser
Automobiles, Antivibration device for....C. C. Dodge
Axle driving-gear for dynamos, Car-....W. I. Thomson
Axle for tilting platforms, Drop-....W. L. Hansen et al
Axle-skein....J. Tanck et al
Back-band hook....H. P. Little
Baking machine, Sugar-wafer-....F. M. Peters
Balancer set....L. E. Underwood et al
Baling-press binding attachment....G. A. Miller
Ballot, Mechanical....D. L. Newcomb
Barb-wire, Device for distributing or taking up..C. Fox
Basket....W. J. Thomas
Basket-making machine....E. Horton
Bath cabinet, Combination steam and water....J. F. Grubbs
Bath-spray....I. J. Owen et al
Battery-holder....E. S. Egge
Beacon, light-buoy, &c....R. M. Dixon
Bearing and attachment, Dust-proof disk....N. R. Nelson
Bearing, Antifriction thrust-....P. Völker
Bearing for carpet-sweepers, Ball-....F. C. Mason
Bearings, Manufacturing and assembling ball-..E. G. Hoffmann
Beets, Treating sugar-....M. Weinrich
Bell, Electric....D. M. Bliss
Belt-fastener....A. L. Eaton
Belt-guide....H. R. Kueffer
Bench-drawer....B. L. Waters
Bicycle-saddle spring....M. M. Deem
Bicycles, &c., Gearing mechanism for....W. B. Smith
Binder attachment....J. M. Darrow
Binder for loose leaves, Temporary....H. Wiedeman
Binder, Loose-leaf....F. H. Smith
Binder, Temporary....L. M. Morden
Blind, Window-....G. P. Mitchell
Block-signal, Electric....E. P. Matter
Boat....F. Audet
Boiler-tube cleaner....A. T. Stewart
Bolt....F. P. Pfleghar
Book....J. Griesinger
Book-cover....J. L. Read
Book, Loose-leaf....W. J. Schultz et al
Bookkeeping system and leaf forming part of the same....G. H. Vroom
Bottle....A. J. Farmer
Bottle-cap....O. Ducker
Bottle-closure....J. Dickens
Bottle for case goods....C. M. Berry
Bottle, Non-refillable....C. D. Collison
Bottle, Non-refillable....A. Huber
Bottle, Non-refillable....J. Meyer
Bottle, Siphon-....D. Landau
Bow-instrument attachment....J. Y. Brown
Box-strapping, Machine for making twisted-wire....R. H. Norton
Bracket....J. Povall
Braiding-machine....W. Körting
Braids, laces, and other narrow fabrics, Packet for....P. Gardner
Bridle-bit....C. B. Johnson
Bridles, Crown-loop for harness-..J. B. Calvert
Brim-stretching and hat-blocking machine....G. Segschneider
Brine, Apparatus for electrolysis of....C. F. Carrier, Jr.
Buffer, Hand-....F. B. Deming
Building-block....O. P. Lundell
Bull-rings, Manufacture of....C. P. Showell
Bunsen burner....P. von Wouwermans
Burglar-alarm....A. Faust
Butchering-tool....F. Schmit
Butter, Washing....V. G. Smith
Button, Detachable....N. Illoway
Cab signal system....D. P. Thomson
Calculating-machine, 2 pats....H. E. Goldberg
Calculating-machine....W. P. Quentell
Calculating or adding machine..W. P. Quentell
Can-making machine....B. F. Mann
Cans, Detachable and reversible spout or nozzel for dispensing-....G. W. Cole
Candy-pulling machine....E. M. Robinson et al
Caoutchouc, Manufacturing artificial, P. Beresin
Capstan, Traveling....H. M. Fisk
Car....O. E. Edwards, Jr.
Car-brake....C. V. Rote et al
Car-door....G. O. Helvig
Car-door fastener....G. Lighthiser
Car door, Grain-....J. H. Jones et al
Car-door-operating mechanism....C. G. Harrington
Car doors, Combined track and roller support for freight....J. P. Williams
Car-fender....A. Hessemer
Car fender, Electrically-operated street-railway-....N. Fallek
Car, Ore....C. L. Pennell
Car, Railway-....E. I. Dodds
Car, Railway dumping-....E. I. Dodds
Car, Sleeping-....L. Hofschneider
Car transom and other window screen, Railway-....C. J. McNitt
Car-underframe....C. H. Howard
Car-underframe....J. S. Andrews
Carbureter....C. Krebs
Carbureter for internal-combustion engines....P. Allen
Carbureter for internal-combustion engines....S. A. Horstmann
Carbureting apparatus, Air-..C. L. Meyer et al
Cartridge-rope from explosive gelatin, Machine for forming a, 4 pats....H. Auchu
Cask rinsing and airing appartus....C. Gülke
Casket-handle....A. P. Gillen
Castrating-tool....J. N. Gassett
Catamenial device....A. I. Jordan
Caustic holder, Lunar-....J. P. O'Connor
Celluloid substitute and making same....E. A. L. Rouxeville
Cement-block machine....J. Wengs
Cement-brick machine....D. H. Herritt
Cement column....R. H. Guyer
Cement-molds, Corner-lock for....H. A. Carmichael
Chain, Drive-....C. G. A. Schmidt, Jr.
Change-maker....E. R. Gill
Change-making machine....I. Rosenfeld
Chlorin from raw bromin, Removing....K. Kubierschky
Chronograph....E. B. Merriam
Chuck, Drill-....D. J. O'Leary
Churn....H. W. Mabry
Churn and butter-worker, Combination....A. S. Eastman
Cleaning compound....G. Hegyi
Cleaver, Wood-....A. Bienk
Clock, Repeating alarm-....W. D. Davies
Closet-bowl....G. W. Palmer et al
Clothes-drier....M. B. Fitts
Clothes-line reel....H. Canney
Clothes-pounder....G. E. Norris
Clutch, Friction-....L. E. Warren et al
Cobalt ores and refining cobalt from nickel, arsenical, and silver-bearing ores, Treating....E. E. Armstrong
Cock for controlling fluid under pressure....J. A. Dyblie
Cocoa-beans, Sorting....J. M. Herron
Coin-controlled machine....M. Hofheimer
Coke, Manufacture of....J. H. Hillman
Collar....W. J. Bruehl
Collar pad, Horse-....J. H. Taylor
Concrete ash-pit....J. W. Graham et al
Concrete-mixer....F. B. Gulzow
Concrete, Reinforced bar for....C. F. Varney
Concrete-reinforcing bar....W. W. Ramsey
Concrete sidewalk, Reinforced....F. J. Miller
Concrete structures, Metallic reinforcement for....E. D. Pitt et al
Conveyer....D. E. Washington
Conveyer, Swinging....C. Bradford
Cooking and heat-retaining apparatus....M. O. Anthony
Cooking or culinary utensil....L. J. Ellis
Copper from ore or matte by electrolysis, Recovering....H. K. Hess
Copy-holder....J. A. Gardenhire
Corn-husking machine....E. G. Adams
Corn-rack....F. D. Dutton
Corn-slitting device, Sweet-....G. A. Bahn
Corner-bar....C. B. Cushwa
Cotton-chopper....J. S. Williams
Cover....D. F. Forwood
Crane, Forging-....C. J. Miller
Crate, Shipping-....E. L. Reed
Cultivator....V. M. and C. P. Powers
Cultivator....C. R. Dean
Cultivator, Drag-bar....R. W. E. Hayes
Cultivator weeder attachment....F. M. Everingham
Culvert....D. C. Boyd
Curtain-fixture....G. Ebenhoch
Cutting implement....G. W. Haskins
Cylinder or tube....R. J. Hoffman
Damper and pressure regulator....J. B. Bischoff
Dental-crown-swaging machine....L. C. Graham
Dental-engine mandrel....H. S. Hughes
Dental-syringe attachment....C. W. Hale
Dental tool....E. R. Sausser
Desk....T. H. Thompson
Desk, Adjustable....J. F. Field
Diaper-cover....H. Wimmel
Digging-shovel....W. J. Newman
Disintegrating, washing, and screening machine....C. B. C. Storey
Display-stand....H. B. Sabin
Distilling glycerin....F. J. Wood
Door-lock, 2 pats....F. P. Pfleghar, Jr.
Door-locking device....G. B. Tayler
Door-operating mechanism....C. G. Harrington
Door stop and fastening....W. Scott
Dough-sheeting machine....F. M. Peters
Draft-equalizer....C. Peres
Draft-regulator, Automatic....H. J. Westover
Drag, Rotary soil-....C. W. Barzee
Drawing-board, Adjustable....W. Zörnsch
Drill-boring attachment....O. Osborne
Drill-rods and pipes, Holder for..S. L. Brannan
Drum....F. Cipar
Drum, Rotating....R. F. Abbé
Dumb-bell for physical exercises....G. Nohl
Duplicating apparatus, Stencil-....A. B. Dick
Dust separator and collector....W. F. Moughler
Dye, Dark-blue-violet....K. Schirmacher et al
Dye, Dark-green-black....K. Schirmacher et al
Dye, Red vat-....K. Schirmacher et al
Dyestuffs, Making vat-....A. Schmidt et al
Dynamo suspension....W. I. Thomson
Egg-tester....C. F. O'Dell et al
Egg-tester....E. Culver
Electric-cable terminal....C. W. Davis
Electric carrier....S. H. Libby
Electric, 2 pats....C. E. Wilson
Electric ignition apparatus....R. Huff
Electric-light support....P. N. Thevenet
Electric lights, Wall-bracket for....W. R. Atkinson
Electric machine, Dynamo-....H. Berg
Electric motor....E. Hopkinson et al
Electric switch....E. M. Coffin
Electric switch....G. Cutter
Electric switch....S. Hoadley
Electric vibrator....J. M. Dinkins
Electrical plug and receptacle....P. C. Brown
Electrode for electric furnaces, Sectional....C. E. Wilson
Electrode-holder for electric smelting-furnaces..C. E. Wilson
Electroplating apparatus, 2 pats....G. A. Lutz
Electrotypes, Production of..S. O. Cowper-Coles
Emergency-brake....F. B. Corey
Engine....W. A. Edwards et al
Engine....C. V. Martin
Envelop....C. J. Fisher
Evaporation, Apparatus for continuous....H. Winter
Evaporator-cooler....B. M. Hodgins
Excavator, Power-....F. E. Kersey
Expansion-trap....R. M. Dixon
Explosive compound engine....E. J. Woolf
Explosive-engine....J. S. Losch et al
Extension-table....S. A. Nichols
Extract-preparing apparatus....G. Giovanna
Eyeglass-mounting....L. T. Loudon
Eyeglass-mounting....J. R. Van Tassel
Eyeglasses....F. M. Vance
Fastening device....H. C. Gros
Feed-bag holder....E. H. Marshall
Feet, Arch-supporter for flat....B. Ruhmann
Fence, Artificial-stone....L. Townsend
Fence-post....R. Titsworth
Fender....R. D'Oronzio
Fender and track-cleaner, Combined....J. P. Manson
Fiber-cleaning machine....C. Schofield
Fibers from rhea-plants, Producing....G. H. Roeder
Fifth-wheel....J. W. Cotton
File, Account-....E. J. Vickers
File, Duplicate-sale-slip....H. McCormick et al
Fire-alarm....G. H. Carroll
Fire-extinguishing engine....W. R. Johnston
Fire-fighting apparatus, 2 pats....E. F. Sanford
Fire-protective system....T. H. Walker
Fire-shutter, Automatic....E. H. McCloud
Fireproof roofing-tile....E. J. Winslow
Fish-bait....H. D. Klein
Fish, Vehicle for transporting live....F. J. Rochow
Fishing-tackle....B. F. Flegel
Fleeced ribbed web....R. W. Scott
Float....F. M. Stevens
Floating bodies, Apparatus for regulating the depth of moored....K. O. Leon
Floor-dressing machine, 2 pats....C. B. Wattles
Fluid-drawer....T. G. Strater
Fluid-meter....R. Howe-Gould
Fluid-pressure-controlling mechanism....H. A. Carpenter
Flushing device....E. Bindewald
Flushing-tank....G. W. Palmer et al
Flying-machine....W. Halle
Flying-machine wing....E. E. Warner
Friction-coupling....W. Beilke
Fruit-pulping apparatus....J. Hulings et al
Fuel-briquet....A. M. Mannewitz
Furnace supplemental draft device..J. C. Teller
Furnaces, Flue and valve system for....J. B. McKennan
Furnaces, Nozzle for the supply of liquid or gaseous fuel to....O. Bender
Furnaces, Sprayer attachment for....G. H. Clements
Furnaces, Working gas-....P. Schmidt et al
Fuse igniter, Blasting....B. F. Pearson
Galvanometer....S. G. Brown
Game apparatus....A. A. Walrath
Garment-fastener....F. Moskovits et al
Garment-hanger....J. M. Acheson
Garment-support....E. H. Luebbers, Jr.
Garment-supporter....B. F. Orewiler
Garment-supporter clasp....J. J. Buchanan
Gas-burners, Ignition device for..M. Baer et al
Gas-engine....H. A. Hettinger
Gas-engine....T. A. Sammons
Gas-filter....C. N. Olsen et al
Gas generator, Acetylene-....A. S. Phelps, Jr.
Gas-igniter....C. T. Giorgi
Gas-producer....H. T. Newell
Gas tips, Machine for making acetylene-....C. S. Steward et al
Gate....G. W. and C. E. Goss
Gate....J. H. Bauer et al
Gate....W. M. Dillon
Gate-fastener....P. O. Peterson
Gearing....C. Wicksteed
Gearing, Change-speed....H. Le Blon
Gem-setting....R. K. Hohmann
Glass-manufacturing apparatus, Wire-....A. Gessner
Glove, Base-ball....J. Gamble
Glove-turner....S. A. Robinson
Gluing-clamp....E. Barker
Governor, Marine....L. D. Kissack
Grain-dampener....A. H. Kirk
Grain-separator....M. Leonard
Grain-weigher, Automatic....G. M. Baird
Grinding-machine....M. Dickerson
Grinding-mills, Supplemental hopper for....F. B. Tice
Grinding plastic substances, such as chocolate, &c., Machine for....G. S. Baker
Harvester, Tobacco-....S. E. Loxley
Hat-blocking machine, 2 pats....A. B. Waring
Hat-frame-forming device....J. Nattenheimer
Hat-protector....A. G. Kiner
Hatch-covers, Mechanism for moving....T. B. Armstrong
Hay-carrier....R. Miller
Hay-fork....C. Foss
Hay-handling mechanism....M. H. Madsen
Hay in barns, Apparatus for unloading....C. L. Burgner
Hay-loader....C. Graves
Hay pitching and stacking apparatus....E. Murray
Hay-rack....E. J. Wells et al
Heat-radiating device....J. L. Perkins
Heater....H. Bevan
Heel....R. H. Bennett
Hides or skins into leather, Converting....A. E. Kelk
Hinge....J. W. Donaldson
Hinge, Flask-....H. F. Manifold
Hoisting apparatus for dredgers and the like....R. M. Wilson
Holding device....E. S. Smith, Jr.
Holding or retaining device, 2 pats..S. P. Craig
Hook-separating mechanism..W. P. Bartel et al
Hop-pole....O. M. Knox
Horse sanitary-pan....A. Holpueh
Horseshoer's clenching-pliers....E. Robidoux
Hose-coupling....J. M. Towne
Hose-coupling....W. Skerman
Hose, Device for putting on and taking off....G. Spiess
Hose or pipe coupling....S. D. Barnett
Household article....J. F. Wynkoop
Hydraulic machinery, Throttling device for....C. L. Taylor
Hydrocarbon-burner....W. H. Wilhelmy
Incubator....J. L. Nix
Incubator....W. E. Tredway
Index....W. J. Roussel
Injector....L. E. Hogue
Insect-exterminator....W. L. Boyd
Insole for boots and shoes....I. Askins
Insufflator....S. Hasbrouck
Intrenching-tool....G. F. Elliott
Iron, steel, &c., Rust-proofing....A. Bontempi
Ironing-board....S. E. Shurtz
Jack....A. S. Dehler
Jewel-holder....A. T. Hunt
Jewelry-polishing device....C. H. Hodgkins
Joint-wiping apparatus....R. M. Corcoran
Journal-box....J. S. Patten
Key-bolt and automatic lock therefor....W. M. McIntosh
Kitchen utensil, Combination....C. R. Tuson
Knife....C. E. Billings

Knitted web....R. W. Scott
Label-pasting board....L. Daum
Lacing-hook....J. C. Lehmann
Ladder, Combined step and extension....I. M. Harpster
Lamp-burner....J. M. Beadles
Lamp-burner....H. L. Swazey et al
Lamp, Gas-....R. M. Dixon
Lamp socket, Electric-....C. G. Burton
Lamps, Starting device for mercury-vapor electric....L. A. Audibert
Last....W. Wiggins
Laster, Heel-seat....C. F. Pym
Latch....G. W. and C. E. Goss
Latch....P. Dunford
Latch and lock, Door....F. Herbeck
Lathe-driver....J. Burt
Lathe-driver....L. H. Vold
Lavatory, Portable....A. W. Cale
Lease-reed....M. Walter
Lease-rod, Oscillating....N. and D. Paquette
Ledger, Loose-leaf....G. F. Gillett
Lens-grinding machine....C. C. Allen
Lenses, Machine for grinding toric....C. F. Wall et al
Letter-sheet and envelop, Combined....C. L. Benedict
Lid-support....W. A. Schiller
Life-saving appliance....C. H. Krüger
Lime and sulfur boiling apparatus....F. O. Moburg
Linotype-machine mold....D. Petri-Palmedo
Liquid-ripener....A. Jensen
Liquid-supply apparatus, Air-exhausting....C. A. Claflin
Liquids, Apparatus for removing foreign substances from....M. Altolaguirre et al
Liquids, &c., Regulator for....H. Sandvoss
Loader, excavator, and pile-driver, Combined....C. L. Baker, Sr.
Loader, Gravel....E. A. Stroschein
Loading apparatus....N. Jorgensen
Loading apparatus....J. C. Cobb
Loading-pack....E. E. Neal
Lock-guard....D. Y. Wheeler
Locking-hook....B. F. Emery
Magneto for sparking mechanisms....H. H. Brown
Mail-bag catcher....O. C. Brett
Mail-cart....F. H. Cunningham
Mail-chute, 2 pats....J. W. Cutler
Mail-chute locking device, 2 pats..J. W Cutler
Manicuring-tool, Pocket....A. Holmquist
Manifolding-pad holder....A .F. Staples
Mantle-support and protecting same..J. P. Harris
Marking-machine....W. P. Dun Lany
Massage-apparatus....J. H. Kellogg
Match-machine....W. H. Parker
Mattress-frame....R. W. Miller
Measuring and mixing liquids, Means for....H. S. Cornish
Measuring distances, Instruments for optically..H. Jacob
Measuring-tape, Flexible steel or metal....H. J. Rabone
Meat-tenderer....G. E. Smith
Mechanical chair....S. G. Wilson
Mechanical movement....E. Thompson
Merchandise, Protecting means for the ends of rolls of....W. E. Rothermel
Metal blanks, Making circular wrought, 2 pats....J. M. Hansen
Metal-bound box....E. E. Flora
Metals, Working....S. Zietarski
Mine prop....F. Nellen et al
Mirror for motor-vehicles....H. Cain
Mold....S. S. Chezem
Mold and making the same....W. P. Dun Lany
Mold and mold-lining....E. G. Acheson
Molder's-flask attachment....J. N. Perkins
Mop and brush making machine....L. Stocker
Motors, System of control for electric....A. C. Eastwood
Mower, Lawn....W. N. Merritt
Music-leaf turner....R. Langstaff
Music-sheet....C. E. Peck
Musical instrument, Automatic..B. A. Hoglund
Musical instrument strings, Device for stretching....J. W. Van Houten
Musical instruments, Expression device for keyboard....J. W. Darley, Jr.
Musical instruments, Motor for music-rolls of pneumatic....B. A. Hoglund
Musical instruments, Pneumatic action for mechanical....B. A. Hoglund
Nest, Hen's....L. S. Linder
Nest, Trap....C. E. Goodenough
Nest, Trap....G. W. Spence
Newspaper parts, Machine for assembling....C. D. Curry et al
Nitrogen compounds, Making..A. Frank et al
Nozzle, Suction....C. W. E. Boegel
Nut for axles, Lock....R. T. Fitzpatrick
Nut-lock....A. A. Allen
Oil-burner....O. E. Brown et al
Oil-can....H. W. Hubbard
Ore-separator....J. R. Yount
Overshoe....E. P. Rickert
Oyster-carrier....R. C. Bender
Package, Moisture-proof....H. G. Eckstein
Packing-case, Sheet-metal, 2 pats..A. T. Kruse
Packing or shipping box....J. T. Ferres
Padlock....C. E. Johnson
Pail cover, Milk....J. R. Bostwick
Paper-box machine....C. W. Gay
Paper, Commercial....J. C. Bell
Parer and slicer, Fruits and vegetable....S. Nagasse
Pattern-plates, Apparatus for use in manufacturing small metallic....P. Bonvillian
Pattern-pouch and sales-check, Combined....T. McCampbell
Pen, Fountain....F. H. Wurdemann
Phonograms, Making....R. P. Winne
Phonograph-horn....C. A. Beppler
Photography, Apparatus for flash-light....G. R. Lawrence
Pickle-fork....H. Babin
Picture-hanger....H. C. Burnard
Picture-projecting machine, Moving-....O. T. Weiser
Pie cutter and crimper....A. H. Stillwagen
Pier or breakwater....J. A. Mitchell
Pipe....A. K. Bowman
Pipe coupling, Automatic train-..C. H. Stamm
Pipe-grab....W. S. Seaman
Pipe-wrench, Chain....G. Amborn
Planetarium....F. J. Trippensee
Planter....C. W. Michael
Playing-hoop....J. G. Marsh
Plow....J. W. Farrington
Plow....M. O. Bregstrom
Plow, Disk....C. A. Hardy
Plow-fender....J. A. Raiford
Plow harrow attachment....E. M. Kramer
Plow shovel, Corn....J. J. Conrad
Plow-stock....J. A. Raiford
Plow, Wheel-....W. E. Johnson
Plow, Wheel-....J. McMullan
Plowshare....J. B. Crapo
Plug and stop-cock, Combined....B. F. Palmer
Plugs, Device for replacing fusible..E. Oldman
Poke, Animal....C. H. McCracken
Post-hole digger....J. P. Anderson et al
Poultry indicator and marker..C. M. Renshaw
Power electrically, Means for transmitting....G. Lewin
Power from axles of railway-cars, Means of transmitting....L. C. Maher
Power-transmission device....C. A. Schlachter
Power-transmission device....C. P. Hollister
Power-transmission means..I. E. and A. W. Caps
Power-transmitting device....A. B. Cohn
Power-transmitting mechanism....F. R. and C. E. S. Burch
Press for manufacturing briquets, blocks, artificial stone, &c....W. Surmann
Pressure-gage....O. Arnold, Jr.
Printing device....J. S. Duncan
Printing-machine....W. H. Thomas
Printing-press, 2 pats....H. T. Kingsbury
Printing-press....R. Miehle
Printing-press....H. G. Barrett
Printing-press sheet-delivery mechanism....H. P. Brown et al
Projector....C. E. Lord
Propeller, Screw....R. E. Coon
Propeller, Ship....C. J. H. Flindt
Propelling ships, Means for....W. Bethany
Propulsion and submarine boats..G. F. Jaubert
Puddling, Furnaces, Oscillating....J. P. Poe
Pulp and paper, Apparatus for reclaiming matter discharged in the manufacture of..J. M. Dohan
Pulverizer, Soil....S. J. Hardin et al
Pump....P. A. Myers
Pump, Air or vacuum....W. M. Fleming
Pump attachment....P. Schlageck
Pump-regulator, Electric....A. Koesche
Punch, Paper....S. Wollheim
Radiator for cooling liquids....T. C. Fedders
Radiator manufacture, Sheet-metal..T. H. Walker
Rail-brace....J. Oldendorf
Rail-brace....G. L. Hall
Rail cross-ties, Dowel for fastening wood-screws in....C. Wilkie
Rail-joint....J. G. Smith
Rail-joint....M. E. Semple
Railway block system....O. Barnish
Railway-brake, Fluid-pressure....W. A. Weant
Railway-chair....F. J. Sterner
Railway-crossing....A. Bertrand
Railway, Pleasure-....E. F. Gardner et al
Railway-rail, Compound....A. P. Finley
Railway-signal check, 2 pats....C. W. Coleman
Railway-switch....P. D. Hibner
Railway-train signal-flag....M. J. Horan
Railway-vehicles, Automatic stop for....J. H. K. McCollum
Railways, Current-collector for the third rail of electric....J. G. Baukat
Ram, Hydraulic....A. H. Francfort
Rat-trap and bucket, Combination..C. Herndon
Razor, Safety, 2 pats....L. T. Snow
Recording-tool....P. P. Coler
Refrigeration apparatus, 2 pats....A. R. Sprague
Rein-protector....L. G. Schlenk
Reinforcing-bar....E. L. Adreon, Jr.
Relay, Electric....E. Weston
Renovators, Sight-glass and separator for pneumatic....W. F. Moughler
Reproducer....C. L. Chisholm
Retort and shaker, Combined....J. S. Guibbini
Reverberatory furnace....F. Cotton
Revolver....C. C. Call
Rock-drills, Water-supplying attachment for....H. Hellman et al
Roller-mill....G. Briddon et al
Roller-mill, Centrifugal....A. Raymond
Rolling screen....J. L. McCall
Rope-clamp....E. Carey
Rope-clamp....A. L. Adams
Rope-grab....L. and E. L. Stephens
Rule-holder....B. V. Winsor
Safety-limit switch....H. A. Everett et al
Sash and blind lock, Combined..C. N. Kalstrom
Sash-balance....E. M. Erb
Sash-lock....W. H. Culp
Sash-lock....G. W. Stewart
Sash-lock....J. W. Bowman
Sash lock and adjuster....T. Richards
Saw, Band....W. Carey
Saw-handle....C. M. Larkin
Scaffold....D. Flatley
Scarf-pin clutch....A. Rosenbaum
Scissors....A. L. Mosby
Scraper, Wheeled....N. S. Dunaway
Screw-driver and attachment therefor....J. M. Chappel
Seal, Bottle....W. S. Dorman
Seal, Electrical socket....L. T. Hatfield
Sealing device for money-bags...M. E. Jewett
Seeder....C. J. Kalkhurst
Separator....R. Scheibe
Sewing-machine....W. F. Arndt et al
Sewing-machine attachment....F. J. Kaufmann
Sewing-machine presser-foot....J. M. Merrow
Sewing-machines, Upper-deflector for shoe....C. A. Gilbert
Shade and curtain-pole holder, Adjustable window....C. W., Jr., and G. H. Draper
Sharpening machine, Saw....E. C. Filstrup
Sharpening machine, Saw....L. L. Filstrup
Shield for the use of linemen....G. E. Harrison et al
Shirt....E. J. Quigley
Shock-absorbing device....G. R. Smith
Shock-handler....G. F. Pettit
Shoe-cleaner....O. T. Crites et al
Shoe tree or last....T. W. Post
Sifter, Ash....A. Manzo
Sign, Illuminated....J. W. Ellis
Sign receptacle, Electrical....F. J. Russell
Signal device, Electric....E. Schermerhorn
Signaling apparatus....W. T. Stanworth
Skewer and bearing therefor....R. Schofield
Skirt-marker....I. H. Peck
Slat-weaving machine....H. W. Carpenter
Sled, Logging....R. G. Noyes
Sled, Motor....W. P. Eastwood
Sole-pressing machine....B. P. Mayo
Sound-recording apparatus....F. W. H. Clay
Sound-reproducer....R. B. Smith
Spark-arrester....L. H. Starrett
Spark-plug....W. B. Hayden
Speaking-machine....C. S. Chisholm
Speed mechanism....F. H. Hodgkins
Stack-Protecting apparatus, Grain....J. P. A. Anderson
Starch, Apparatus for making thin boiling....T. E. Breyer
Starch, Making thin boiling....T. E. Breyer
Stay-roller....F. Shimerda
Steam and hot-water boiler formed of circular sections....W. M. Mackey
Steel or other metal wool, Apparatus for manufacturing....H. C. Gamage
Steering-wheel....R. W. Lowell
Stencil and frame, 2 pats....R. S. Bolger
Stenciling-machine....S. T. Smith, Jr.
Sterilizing....E. P. Beckwith
Stop-motion....F. Ott
Store-service apparatus....I. W. Litchfield
Stove-ring....G. E. Palmer
Stovepipe-joint....O. M. Cowles
Strainer for coffee-urns....G. Epstein
Street-indicator, Automatic....T. Tighe et al
Street-sweeper....J. H. Long
String instruments, Resonant box of....G. Somerville
Stuffing-box with reversible gland..G. S. Power
Stump and root puller....C. Bittner
Submerged bodies, Apparatus for examining....D. Pepin, Sr.
Sulfuric anhydrid, Catalytic apparatus for making....G. Eschellmann et al
Sunshade....W. L. Ridout
Suspenders....M. Neima
Swinging gate....W. J. Knutzen
Swingletrees to doubletrees, Means for attaching....J. Lorenz
Switch-lever lock....F. W. Moore
Table and fitting-stand, Combination....J. M. Acheson
Table locking device, Extension....W. M. Jos.
Table-support....V. C. Luppert
Talking-machine....T. Kraemer
Talking-machine needle....G. Konigstein
Talking-machine stylus....S. Glodfaden
Tank-gage....G. E. Musgrove
Tank-heater....A. W. Van Rinsum
Telephone-boxes and the like, Coin-controlled mechanism for....F. X. Bee
Telephone cut-out....E. W. Smith
Telephone-receiver....H. G. Pape
Telephone-relay....C. W. Underwood
Telephone-switch....A. N. Wright
Telephonic calls, Apparatus for registering....C. W. Sharer
Telescopes, Mounting of sighting....H. Jacob
Tenis-racket....C. P. Thomsop et al
Thermostat....F. P. Butman
Thread-cutting device....G. A. Smith
Threading-tool....H. Jansen
Threshing-machine cylinder....A. H. Berg
Threshing-machine-feeding mechanism, Automatic....G. O. Appel
Time-movements, Electric escapement for....C. F. Hollister
Time-recorder, Workman's....C. T. Hawley
Tire-case....A. H. Kinder
Tire-protector....H. M. Bradley
Tire, Vehicle-wheel....T. A. Silverwood
Tire-wire-pulling machine....J. A. Barbrake
Tobacco-cutter....A. W. Teasley et al
Tobacco-leaves, Machine for stringing up....O. and A. Graf
Tobacco-moistener....J. P. Gates
Tool, Flexibly-supported....T. Nichols
Tool-wrench, Combination....A. Partin
Toy bank....A. E. Jacobs
Toy, Detonating....T. E. Mitchell
Trace-carrier....A. B. Meinhardt
Trace-holder....H. A. Bierley
Track-sanding device....E. J. Anderson
Track-system, Transfer....G. P. Baldwin
Tracker-bar....J. Hattemer et al
Training-string connector....O. M. Knox
Trains, Means for transferring passengers and the like to and from moving....F. H. Cook
Tricycle....N. Larson
Trimming-machine....J. R. Welch
Trolley....C. Harkness
Trolley-pole controller....C. R. Traxler et al
Trolley-wheel-placing device....H. G. Husted
Truck-bolster....A. S. Blanchard et al
Truck, Car....A. E. Ostrander
Truck-frame....J. M. Rohlfing
Truss-pad, 2 pats....E. R. Bathrick
Tube-cutter....O. Thomas et al
Turbine brake, Elastic-fluid....W. L. R. Emmet
Turbine, Elastic-fluid....R. H. Rice
Turbine-governing mechanism....J. G. Callan
Turbine-governing mechanism....R. H. Rice
Turbine-motor....A. Jude
Turbine, Steam....J. Stumpf
Turbines, Guide blade and vane for....A. Jude
Turpentine from wood, Extracting..J. G. Gardner
Type-bar holder, Metal....J. S. Duncan
Type-writer....C. Booth
Type-writer....P. Grützmann
Type-writer liner....C. M. Sorensen
Type-writer paper-feed attachment....B. F. Hutches, Jr.
Type-writing machine....A. F. Smith
Type-writing machine....F. A. Young
Type-writing machine....Z. G. Sholes
Umbrella, Folding....H. P. Petersen
Umbrella-runner....R. Suter
Vacuum-pan....A. P. Smith
Valve....J. D. Maclachlan
Valve....G. Fusch
Valve....L. B. Hoffner
Valve, Automatic time-....A. A. Shingleton
Valve, Distributing-....H. Lentz et al
Valve for compressors, blowing-engines, and the like, Annular....J. A. Willaredt
Valve for turbines, Regulating....R. H. Rice
Valve-gear....C. C. Vinson
Valve-gear for steam-engines....A. D. Baker
Valve mechanism for steam-engines, Throttle-, 2 pats....G. B. Petsche
Valve-stem and tire-deflation alarm..A. E. Kay
Valve, Water-relief....G. W. Day
Valves, Mechanism for operating indicators for hydraulic....G. W. Knight
Vapor conductors, Exhausting..A. M. Jackson
Vegetable-cutter....A. Bronson
Vehicle-clip....F. F. S[illegible]
Vehicle-shafts and tongues, Attaching [illegible]....S. A. D[illegible]
Vehicle-spring....J. S. C[illegible]
Vehicle-wheel....G. [illegible]
Vessel-coaling apparatus....L. N. De M[illegible]
Vessel-unloading apparatus, 2 pats..A. S[illegible]rtz
Vessels, Coating the surfaces of..W. Ad[illegible]
Violin-mute....J. M[illegible]
Wagon-raiser....A. C. Hos[illegible]
Wagon-springs, Device for the relief of....f....W. Mayb[illegible]
Wardrobe appliance, Combined....J. Morrison, Jr., et [illegible]
Wardrobe or safe....A. L. Ellison
Washboiler....L. B. Person
Washing-machine....C. A. Dowe
Watch....W. E. Porter
Watches, Pocket attachment for..F. Krzeczek
Water-closet cistern....J. R. Hall
Water for irrigating and other purposes, Device for controlling a supply of....R. G. Kennedy
Water-gate....E. E. Izer
Water-motor....F. Breitenstein
Weaner, Calf-....C. E. Hoppenrath
Weather-strip....W. Van Horn
Well packer....L. E. Robinson
Wheels, Bolt tightener and cutter for....B. M. Nation
Whip-socket....L. Setzer
Winding-machine, 2 pats....S. W. Wardwell
Winding-machine reel....C. W. Pilscheur
Window frame and sash....T. A. Hodgson
Window or like screen....C. C. Armstrong
Window or shutter operating device....A. K. Lovell
Window protective shield....A. Bennerscheidt
Window-screen, Roller....C. J. Wallen
Wire, Apparatus for maintaining the tension of a moving....R. E. Manley
Wire clamp or grip....H. Eubank
Wire-grip....J. T. Gardner
Wood-molding machine....F. D. Green
Woven fabric, Double-faced....J. C. Earnshaw
Wrench....H. D. Sargent
Wrench....F. E. Rosekelly
Wrench....A. C. Smith
Yarn and textile goods, Machine for drying....A. N. Marr
Zinc-retort residues, Treating..G. Stolzenwald

DESIGNS.

Dish or similar article, Covered..C. J. Ahrenfeldt
Fabric, Pile....F. E. Kip
Glass, Plate-....A. D. Brogan et al
Glass shade or ball....R. T. Cordeau
Glass shade or globe....M. W. Gleason
Glass shade or globe....P. Schilling
Lace, Levers....C. W. Birkin
Lamp, Gas-....A. Rector
Plate or similar article....C. J. Ahrenfeldt
Radiator, Automatic....C. Schmidt
Sign, Electrically-illuminated....F. W. Lord

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MECHANICAL PATENTS.

Abdominal support....V. V. Davids
Advertising device, Wheel....J. W. Roberts
Advertising-vehicle....F. X. Bimmerle
Air-brake-operating device, Automatic....E. M. Cain
Air-brake systems, Automatic coupling for....B. J. Morgan
Air-brake systems, Safety-valve for water systems in connection with....W. D. Scott
Alloys or compounds of copper and titanium, Producing....A. J. Rossi. (Reissue.)
Alloys, Producing aluminum-magnesium....F. von Kügelgen et al
Ammonium chlorid, Mauufacturing....A. G. French
Angle-coupling....S. W. Robinson
Animal-trap....H. E. Carter
Animal-trap....M. L. Larson
Annunciator....J. T. Needham
Anode....A. M. Hill
Auger....M. E. Thomas
Auger, Coal-....M. Martin
Automobile....C. W. Duer
Bait, Artificial....J. B. Rhodes
Baking-pan....T. Boyd
Baling-press attachment....J. H. Jackson
Band-cutter and feeder....J. H. Kauffman
Barrel or receptacle....H. S. Reynolds
Baskets or demijohns, &c., Bottom for....J. A. Griffin
Bearing Axle-....R. Blum
Bearing, Step-....F. Greiner
Bed-spring....B. McIntosh
Beet-topping machine....J. N. Hanna et al
Belt, Life-....L. Forté
Bending-machine....J. R. Welch
Bicycle parcel-carrier....C. W. Rosencrance
Bicycles, Free-wheel hub for....C. O. Rydberg
Binder, Loose-leaf....H. M. Adler
Binder, Loose-leaf....I. Shultes
Binder, Loose-leaf post....W. H. Garland
Binding and trimming, Bias....J. Armstrong
Blanket-fastening for animals..S. H. Rorabeck
Block-signal....D. D. Miles, Jr.
Block-signal system....W. Daves
Block-signal system....F. E. Kinsman
Blotter, pen-wiper or pen-cleaner, and pen-rack, Combination....M. H. Shapiro
Blower, Pressure-....C. Neumann
Boat....J. W. Gay
Boiler and furnace, Combined....W. J. Ellis
Boilers, Blow-out device for steam-....D. Brews
Boot, Lawn-....G. W. Phillips
Boots and shoes, Waterproof dressing for....E. R. Coburn
Boring-tool....R. N. Melvin
Bottle-cap....E. D. Chellis
Bottle-cap-reshaping machine....G. G. Glenn
Bottle-cleaner....J. Schigelinsky
Bottle-closure....H. Behr
Bottle, Non-refillable....M. Perez
Bottle, Non-refillable....L. Röd
Bottle, Non-refillable....H. L. Baldwin
Bottle, Paste-....A. G. Baker
Bowling-alley pin-setting apparatus....J. E. Kilburn
Box-adjusting mechanism, Automatic....E. McKay et al
Bracelet....H. R. Holbrook

Braiding and lace-making machine....F. Meyer
Brake-beam hanger.....W. Hamilton
Brake-shoe.....W. B. Goodwin
Brush, Shaving.....S. Saloman
Brush, Tooth.....F. F. Shumer
Buckle.....A. Van Duzer
Buckle, Cross-line.....F. E. Siggins
Buckle, Suspender.....W. Bloomberg
Buggy-box-reinforcing device.....W. D. Otis
Buildings, Construction of.....C. H. Wilson
Bumping-post.....G. Hopson
Bunsen burner, 2 pats....P. von Wouwermans
Butter, oils, &c., Renovating.....W. F. Jensen
Button and garment supporter, Combined....
.....M. M. Strauss
Button-blank-cutting machine..G. W. Schreurs
Button, Collar-.....D. A. Hart
Buttonhole cutter or shears.....G. T. Barr
Cabinet for holding disk records.C. H. Progler
Cabinet, Kitchen-.....E. M. Bennett
Calculating-machine.....W. F. Hausstein
Camera, Lens-shutter reflecting..J. D. Garfield
Camera, Photographie enlarging-.F. A. Brownell
Can-opener.....C. J. Johnson
Cans, Reinforced neck for milk-.....E. Mohr
Canal-lock.....S. S. Jamison
Canceling and postmarking machine.....
.....M. V. B. Ethridge
Car-door fastener.....F. Langley
Car door, Grain-.....W. L. Aurand
Car. Dumping.....M. H. Treadwell
Car-fender.....W. B. Reed
Car-fender.....A. W. Shank
Car grain-door.....C. C. Neale
Car grain-door.....G. H. Gilman
Car-pole attachment, Trolley-.....G. R. Dunn
Car-replacer.....H. M. Cawood
Car-replacing wheel.....O. T. Dougherty
Car running-gear, Mine-, 2 pats.....
.....J. M. and R. F. Phillips
Car-stake.....J. W. Stokoe
Car ventilator, Railway-.....H. W. Young
Car vestibule, Stock-.....G. F. Pettit
Carbureter.....C. Schmidt
Carpet and rug cleaning machinc....J. R. Nye
Carving-drill, Pneumatic.....H. Meyer
Carving-machine.....F. H. Richards
Casting-tool.....H. Goddard
Catamenial bandage.....M. E. Doyle
Cement or concrete block mold...A. M. Haight
Cementing-machine.....W. A. Knipe
Chain-link.....G. G. Howe
Chair, attachment.....G. W. Haas
Chart, Adjustable.....W. Horeischi
Check-form.....W. H. Bertram
Checking device for lunch counters, &c.....
.....J. C. Maloney
Chill-mold.....E. A. Tverdahl
Chocolate-warming table.....J. R. Windsor
Cigar-tip.....W. E. Bostick
Clamping and locking device.....
.....W. M. Van Cise et al
Cleaning compound.....H. C. Wright
Clevis.....L. K. McClellan
Clock, Flash-light electrical alarm and bank and
call.....A. Y. Yansen
Clock, Secondary electric.....G. B. Bowell
Clod-crusher.....H. H. Butler et al
Cloth opener, spreader, and guider....A. Birch
Clothes-beating apparatus.....F. Wallerstein
Clothes-line clamp.....W. Mullin
Clothes-rack.....H. C. Teipel
Clutch, Friction-.....F. A. Colwell
Clutch, Friction-.....T. C. Dexter
Coaster-brake, Back-pedaling....A. P. Morrow
Coating-machines and the like, Feeding mechan-
ism for.....R. R. Richardson
Coffee-pot.....H. L. Wells
Coke-oven door.....J. J. Alley
Colander.....E. E. Higgins et al
Collar.....J. K. P. Pine
Column for interior decoration....T. B. Lupo
Compasses.....G. Schoenner
Compressor-regulator.....F. E. Norton et al
Concrete block, Hollow.....H. N. Pettigrew
Concrete construction, Bar for reinforced.....
.....E. E. Slick
Concrete construction. Reinforced.....
.....P. Stragiotti
Conduit-bending device.....J. E. Morris
Conduit, Flexible.....W. S. Brown
Converter, Rotary.....J. L. Murdock
Conveyers, Cleat for cable-chain.E. Demarest
Cooking-vessel.....F. Nestor
Cooling and condensing tower...A. A. Marlow
Copy-holder.....B. F. Truax
Copying device, Letters-.....A. B. Vanes
Corn-husker.....F. A. Ingersoll
Corn-husking machine.....E. B. Harman et al
Corn-husking machine, Green-.W. J. Latchford
Corset.....M. Schottlander
Corsets and other garments, Attachments for..
.....W. J. Parker
Cotton-chopper.....W. D. McClure
Cotton-chopper.....W. McCaleb
Cotton-distributing apparatus.....A. H. Morton
Cotton-picker.....C. H. and D. H. Feary
Coupling.....A. Johnson
Crackers, Making.....F. A. Johnson
Crane mechanism.....H. W. Metcalfe
Crate.....A. M. Keneipp
Crate, Banana-.....G. Becker
Crate filler, Egg-.....J. H. Carter
Culinary utensil.....P. Wirthlin
Cultivators, Replanting attachment for.....
.....E. H. Suhl
Culvert, Corrugated-metal.....J. H. Schlafly
Cupola.....N. Etting
Curtain, Beer-case.....J. M. Jetter et al
Curtain-fixture.....H. H. Schroyer
Curtain-fixture.....T. Widziszowski
Curtain-pole.....J. S. Comissiong
Curtain-pole and shade-holder, Combined.....
.....W. E. Doud
Curtain-pole and shade-roller support, Combined
.....A. C. Taylor et al
Cycles, Apparatus for muffling the exhaust of
motor-.....E. W. Keller
Dampening-machine.....D. P. Moore
Delivery apparatus.....G. Uhlmann
Dental artieulator.....A. V. Dear
Dental forceps.....W. C. Miner
Dental impression-tray.....W. T. Lyon
Dental instrument.....J. T. Wright
Dental swaging device.....R. G. Hopkins
Derrick.....E. J. Ward
Derrick.....H. A. Hettinger
Desk.....J. S. McComb
Desk, School-.....H. R. Witzke
Die and making same.....F. C. Emrick
Digester.....W. H. Atwood
Display-rack.....W. G. Barnes
Distribution-fixture.....W. D. Scott
Ditching-machine.....T. E. Nicholson
Dividers.....C. G. Moberg
Doll.....L. A. Sackman
Door fastener, Sliding-.....W. N. Carroll
Door-lifter.....R. Thoms
Drafting device.....R. D. Watson
Dredges or dredging-chains, Pin for.....
.....W. Brinton
Drinking vessel.....E. Friendlich
Drum-trap.....W. A. Reid
Dry closet.....E. L. Geisel
Dyeing.....G. A. Waldinger et al
Educational appliance.....M. G. Griggs
Electric circuits and apparatus, Protective appli-
ance for.....H. H. Hornsby et al
Electric-conductor connection.....F. O. Ball
Electric currents with increased energy, Means
for transmitting.....J. A. Stratton
Electric-discharge apparatus.....P. H. Thomas
Electric igniters, Contact apparatus for.....
.....J. Krannichfeldt
Electric machine, Static-influence.....
.....H. Wommelsdorf
Electric machines, Cross connection for dynamo-
.....W. H. Foot
Electrical conduits, Junction-box for.....
.....A. McMurtrie
Electrode.....M. Ruthenburg
Electrode, Storage-battery.....T. A. Edison
Elliptic spring.....W. G. Price
Embroidery-machines, Hinge-borer for.....
.....A. Braum
Energy from the direct combustion of fuel, De-
riving.....C. A. Mezger
Engine igniting device, Gas-, 3 pats.....
.....J. V. Rice, Jr.
Engines, Automatic power-releasing device for
draft-.....W. H. Rhodes
Engines, Firing device for gas-....L. L. Lewis
Engines, Means for forcing cooling liquids to
.....A. M. Zimmerman
Engines, Vaporizer or carbuter for gas-.....
.....C. D. Shain
Envelop and letter-sheet, Combined.C. W. Cook
Envelop-fastener.....L. M. Norwood
Etching apparatus, Plate-.....J. N. Axt
Evaporator, 2 pats.....E. Zaremba
Exercising apparatus.....J. P. Thomas
Explosive-mixing machine.....G. P. Jones
Extension-screen, Metallic.....T. Limoge
Eyeglass or spectacle mounting.....H. Silbert
Fabrics, Forming woven pile..J. K. Dalkranian
Fabrics, Machine for cutting pile designs on..
.....G. D. von Hofe
Fare-register-operating mechanism.....
.....W. H. Honiss
Fastener.....P. Sicotte
Fence-post, Concrete.....F. P. Van Hook
Fence-post mold.....J. D. Williams
Ferrosilicon, Producing.....E. F. Price
Fertilizer-distributer....N. H. and J. H. Bloom
File, Clip-.....C. Spiro
Filter.....P. Traulsen et al
Filter.....I. Boyd
Filter for cyaniding and the like, Continuous..
.....B. Hunt
Finger-pad.....M. H. McElhone
Fire-alarm box.....M. W. Hamblin
Fire-escape.....J. W. Hull, Sr.
Fire-extinguisher.....W. A. Bradshaw
Firearms, Front sight for.....J. E. Thompson
Fleshing apparatus.....L. Rupp
Flour and other grain products, Apparatus for
bleaching and aging.....F. Mears et al
Flour and other grain products, Bleaching and
aging.....F. Mears et al
Fluid-pressure generator.....M. Warren
Flush-receptacle.....F. T. Wheeler
Flushing apparatus, Automatic.....R. Brocke
Fly-trap.....J. F. and R. F. Richbourg
Fly-trap.....G. Fredrickson
Fly-wheel....S. P., Jr., and J. P. Wetherill, Jr.
Flying-machine.....E. L. Drake
Flying-machine.....T. J. Whalen
Flying-machine.....E. R. Ernst
Fog signalling apparatus.....T. L. Wilson
Folding bench, Angle-metal.....W. H. Maxwell
Folding table.....A. E. Howlett
Food, Making leguminous.....W. A. Schwalbe
Frog-box.....F. S. Willard et al
Fume-condensing apparatus.....J. R. Moffitt
Funnel.....B. F. Bee
Furnaces, Sheet for boiler.T. C. Rogerson et al
Fuse and fuse-box.....F. L. Sessions
Fuse, Mine-.....L. Lheure
Gaiter.....H. Cohen
Game-counter and the like.....H. G. Hose
Garment-fastener, 2 pats.....F. E. Wilson
Garment-retaining device.....D. Basch
Garter-fastening device, Man's.R. A. Moore, Jr.
Gas-analyzer, Automatic.....H. J. Westover
Gas-generator.....F. Mears et al
Gas-lighting device.....W. K. Elliott
Gasolene engine and pump drain.G. G. Forester
Gasolene-trap.....W. J. Kramer
Germicide, Solar.....J. O. Day
Glass articles, Device for manipulating, 2 pats..
.....F. G. Farnham
Glass, marble, and the like, Machine for grind-
ing and polishing the edges of plates of....
.....V. Kimon
Glass sheets, Implement for cutting shaped sec-
tions from.....C. F. Chapman
Glass tubes, Machine for heating..J. T. Fagan
Gloves, Apparatus for facilitating the putting on
of india-rubber.....C. A. Hoefftcke
Governor mechanism for engines.W. E. Gannon
Grain, Machine for separating hulled from un-
hulled.....A. P. MacDonald
Grain-shocker.....C. M. Cochran
Grate-bar.....C. W. Rolin
Grooving or routing tool.....J. M. Massey
Hammer frame, Power-.....L. J. Clossey
Harness-fitting.....W. H. Ferris
Hat-mold.....F. H. Lee
Hay-rack.....E. H. Moyer
Headers, Comb-reel for.....J. C. Eichelberger
Heater.....G. H. Bartlett
Heating system, Steam-.....J. A. Donnelly
Heel, Boot or shoe.....C. F. Hamel et al
Heel, Cushion-.....R. W. Perry
Heel support, Shoe-.....V. E. Harris
Heels or soles of boots and shoes, Metallic pro-
tector for.....J. H. Vinton
Hinge for screen-door, Spring-.....E. Bommer
Hinge, Spring-.....W. K. Bucher
Hoist.....E. Y. Moore
Hone-holder.....R. J. Brandenburg
Hoop-shaving machine.....A. A. Dailey
Horseshoe.....H. P. Kennedy
Horseshoe.....E. M. Dunn et al
Hose-coupling.....E. Gunnell
Hose coupling, Air-.....W. W. Kilpatrick
Hot-water heater.....C. M. Wheelock
Hub, Wheel-.....R. L. Wilson
Hydraulic press.....W. Astfalck
Ice-cream freezer.....T. L. Valerius
Ice-making apparatus,.....E. T. Williams
Igniting apparatus, Electrical.....E. S. Huff
Immersion-regulator.....A. E. Jones
Implement, Rotary.....C. W. Keen
Induction-coil.....M. S. Brigham
Induction-coil.....J. O. Heinze, Jr.
Ingot-compressing apparatus, 2 pats.....
.....J. Illingworth
Insect-destroyer.....W. R. Craum
Instep-supporter.....A. Toporezer
Insulating and testing system, Cable...T. Cope
Insulator, Electric.....C. R. Slusser
Insulator-pin.....W. Scharfhausen
Insulator. Wire tire for.....W. E. Callane
Internal-combustion engine.....T. Veitch
Internal-combustion engine....A. G. Melhuish
Ironing-board.....G. A. Brinn
Jar-closure.....F. Loffi
Journal-box.....A. O. Buckius, Jr.
Jug-holder.....C. R. Brown
Kettle, Electric.....D. C. Smith
Kitchen utensil.....A. Koeppen
Knives of machines, Guard for the..P. Knuth
Lace fastener, Shoe-.....G. H. Nicholls
Ladder, Extension.....J. A. Caflisch
Ladder-jack.....O. C. A. Block
Lamp.....H. E. Fine
Lamp, Automobile.....L. Blériot
Lamp bases, Manufacture of incandescent-....
.....M. M. Merritt
Lamp, Incandescent.....M. M. Merritt
Lamp, Inverted gas-.....E. R. Wilner
Lamp, Revolving flash-.....E. E. Adams
Lamps, Combined base-ring and bracket for
signal-.....A. H. Handlan, Jr.
Lantern.....J. F. Horn
Lantern-holder.....C. W. Leaning
Lasting-machine.....C. F. Pym
Lasts, Making.....J. J. Smith
Latch, Vehicle-door.....F. C. Altmann
Lead ores, Reducing.....A. Francis
Leather-dressing from sapped or exhausted tan-
ning liquors, Making.....G. W. Childs
Leather-dressing from tanning liquors, Making
liquid.....G. W. Childs
Leather, Extraction of glue from mineral-
dressed or chrome-tanned....A. R. Weiss, Jr.
Leather-rolling press.....C. Voss
Lever for lifting-jacks.....G. R. Booth
Lifting-jack.....M. L. Jenkins
Lifting-jack.....I. J. Keeler
Lightning-arrester.....F. P. Cauble
Lightning-arrester.....N. J. Neall
Liquid-concentrating apparatus.....P. Kestner
Liquid-fuel furnace.....
.....J. W. M., and M. M. Burdon
Loading apparatus.....N. D. Hansen
Lock.....D. W. Crockett
Lock.....H. F. Keil
Lock.....E. Eichler
Locomotives, Skeleton eccentric for.G. M. Ried
Logs, Device for recovering submerged.....
.....J. J. Hathway
Loom.....F. Ott
Loom-shuttle.....J. A. and O. J. Perkins
Loom shuttle-box, Rotary-box-.....
.....A. E., A., and G. Walker
Loom take-up mechanism.....G. S. Cox
Looms, Weft-replenishing for.....J. Gabler
Looms, Yarn-selecting mechanism for tufted-
fabric.....J. K. Dalkranian
Looper-hook.....W. H. Zellers
Mail-bag catching and delivering apparatus....
.....J. C. Dayton
Mail-bag deliverer and catcher....W. H. Rogers
Mail-bag receiving apparatus.....L. H. Burch
Mail-pouch-delivering apparatus....C. A. Willis
Mail-receiving case.....A. Haentze
Manure-spreader.....B. M. Buehler
Marking device.....R. L. Herman
Marking-gage.....O. T. Anderson et al
Mask, Base-ball.....G. H. Ridlon
Massage apparatus, Pneumatically-operated....
.....T. A. McCall
Match, Safety.....G. E. Schultz
Measuring device, Self-registering land-.....
.....J. Finn
Measuring machines, Stamping attachment for
cloth.....F. Wolf
Metal and producing same, Expanded.....
.....N. E. Clark
Metals contained in copper-nickel matte, sepa-
rating the.....J. M. Neil
Milking apparatus.....A. W. Hardy
Mining apparatus.....J. W. Hunsaker et al
Mirror, Folding hand-.....P. C. Petersen
Mitten-pressing machine.....R. S. Lewis
Molding-machine guide.....W. L. G. Williams
Mortise-joints, Method of and means for mak-
ing.....J. L. Gilman
Motor.....C. W. Manzel
Mower reaping attachment....J. W. Pridmore
Music-leaf turner.....H. H. West
Needle-threader.....M. E. and A. T. Lassen
Nut-lock.....W. F. Brown
Nut-lock.....C. L. Hine
Oar.....J. Lehman
Oil, Means for burning.....T. C. Mason
Oil-switch, Electric....J. D. Hilliard, Jr., et al
Oiler, Windmill-.....H. E. Brown
Ore and materials, Rotary screen for.....
.....H. G. King
Ore-concentrating table.....G. E. Woodbury
Ore-concentrators, Drive mechanism for.....
.....G. E. Woodbury
Ore-separator, Magnetic.....R. R. Moffatt
Ore-treating process.....W. G. Swart
Ores, Roasting and sintering.....
.....A. S. Dwight et al
Ores, Treating.....A. S. Dwight et al
Ozone-producing apparatus, 2 pats.A. C. Wood
Package or mail eatcher.....G. Zureher
Packing, Rod-.....J. C. Edgecumbe
Padlock.....S. R. Fraim
Pail support, Milk-.....J. Schuster
Paper and the like, Treatment of gum-.....
.....R. A. MeLaurin
Paper box or container.....J. C. Kimsey
Paper-hanging device.....J. F. Brennan
Paper-making-machine roller and manufacturing
same.....W. E. Sheehan
Peanut-picker.....J. A. Warren
Pen, Drawing-.....G. Schoenner
Pen, Fountain-.....E. R. Smith
Pencils and the like, Attachment for.....
.....F. W. Evans
Percolator-pot construction.....G. E. Savage
Pessary, Therapeutic.....F. M. Siner
Piano-action.....R. Eastwood
Piano-action frame.....F. G. Billings
Pianos, Lock-slip for automatic.R. K. Thumbler
Picture-card.....A. Kinnicutt
Picture-display machine.....H. A. Farrand
Picture-hanger.....M. B. Franklin
Picture-hanger.....O. S. Olson
Picture-holder.....G. N. Marvin
Piles, Means for sinking.....F. B. Gilbreth
Pin tag or ticket.....C. Winkler
Pipe.....W. J. Williams
Pipe coupling, Train-.....W. Z. Pulliam
Pipe-cutter.....R. L. Thomas
Pipe cutting and crimping machine.....
.....T. A. Janssen et al
Pipe-expanding apparatus.....C. Fell
Pipe-wrench.....H. W. Simms
Planers, Cutter-guard for buzz-.....
.....C. O. and A. D. Porter
Planter attachment.....W. D. Gilbreath
Planter marker attachment....G. W. Goldsboro
Planter, Potato-.....C. F. Schmidt
Plastic.....A. Sargent
Plate-doubling-machine attachment.F. Westwood
Plow-disk and the like.....P. Speirs
Plug-seat switch.....B. O. Wells
Pneumatic action.....H. Meyer
Pneumatic-despatch apparatus, Sending mechan-
ism for.....H. D. Waterhouse
Pocket-book.....H. A. Dodge
Potato-masher.....W. A. Prindle
Poultry-fountain.....J. Cullen
Power-shovel jack-arm and mounting.....
.....I. B. Webber, Jr.
Power-transmitting mechanism....W. O. Worth
Preserving-jar.....A. Wilkin
Printed-paper strips in true register, Device for
assembling.....P. Ashelm
Printing-press, especially of the bed-and-platen
type.....A. Burbach
Printing-presses and similar machines, Dampen-
ing device for.....G. W. Prouty
Pulley, Friction-.....H. H. Balliet
Pulley, Loose.....C. M. Swanson
Pump.....M. Latta
Pumping-jack.....L. R. Stone
Punch-holder.....L. J. Sloat
Puzzle device.....R. Haldenwang, Jr.
Radiator wall-sections, Connection for.....
.....J. A. Holfelder
Rail-joint.....G. C. Brown
Rail-joint, Insulation.....B. Wolhaupter
Rail-tie Metallic.....L. R. Custer
Railway-frogs and the like, Heel-block for, 3
pats.....B. L. Weaver et al
Railway-gate, Automatic.....J. Pernat
Railway joint-chair.....C. Herndon
Railway signaling apparatus.....J. D. Taylor
Railway-tie and rail-joint means therefor.....
.....P. Huebschwerlen et al
Railway-tie, Concrete.....H. H. Clough
Railway-ties, Rail-fastening for concrete.....
.....H. H. Clough
Railway-trains, Safety appliance for.....
.....R. C. Millard
Rake attachment, Hand-.....O. Hubbell
Ranges, &c., Water-heating attachment for....
.....E. W. Vest
Ratchet mechanism.....E. A. Schade
Razor.....J. E. Parkison
Razor-strop.....C. W. Babcock
Reamer and boring-head.....R. N. Melvin
Recording and duplicating device.J. C. Proebstel
Reel for ruchings, &c.....L. Sonn
Refrigerator-car.....M. Cooper
Register.....N. D. Nelson
Retorts, Extracting apparatus for horizontal....
.....C. Eitle
Ring-traveler.....A. B. Potter
Rolling ribbed bars.....T. W. Jenks
Rotary engine.....C. E. Rhorer
Rotary engine.....S. W. Vincent
Rotary engine.....C. O. Sherman
Rubber goods, Curing or vulcanizing.....
.....C. L. Pepper
Sand-drier, Centrifugal.....C. S. Lee
Sanitary appliance.....J. H. McCall
Sash-fastener.....G. Zeliff
Saw attachment.....I. H. Howe
Saw-gage and filing-tool.....Z. N. Seelye
Saw, Jig-.....A. Anderson
Scaffold.....W. J. Murray
Scaffold-bracket.....S. S. Richardson
Scaffold, Portable ladder-like.....L. T. Olive
Scraper.....R. Folkerts
Scraper, Drag-.....A. Conkle
Screws, &c., Machine for cutting.....J. Bowen
Seal, Bottle-.....M. Perez
Seal for pipe-joints.....B. F. Shaughnessy
Seal, Metal.....V. Mazzatenta
Seam, Ornamental.....R. Cornely
Seed-linting machine, Cotton-.....J. Davidson
Separator.....E. J. Vaudreuil
Separator.....H. J. Sisty
Separator-liner, Centrifugal.....O. Ohlsson
Sewing attachment, Button-.....
.....W. S. and H. H. Holdaway
Sewing-machine.....E. B. Allen
Sewing-machine binding attachment.A. Rontke
Sewing-machine feeding mechanism.....
.....D. Noble et al
Sewing-machine ruffler attachment..A. G. Lamb
Sewing-machine ruffling mechanism.....
.....A. Laubseher
Sewing-machine strip-guide.....A. Laubseher
Sewing-machine tuck-marker.....A. Laubscher
Shade and lace-curtain hanger, Combined win-
dow.....P. F. Wagner
Shaving appliance.....E. D. Chaplin
Sheet-metal elbow.....A. Dieckmann
Sheets, Means for controlling the feeding of..
.....J. J. Rigby
Shield, Chafing.....E. A. Tietjen
Shingle-butt-cutting machine....J. D. Caldwell
Shoe-polisher.....L. J. Hardin
Shut-off box.....F. M. Eiber
Sign or illuminating device, Electric.....
.....W. N. McComb

Sign, Electric-light....M. Norden
Signaling and telephone system, Composite....H. O. Rugh
Signaling apparatus, Electrical..B. F. Wooding
Signaling system, Electric....J. D. Taylor
Silicospiegel, Producing....E. F. Price
Sizing or slashing machines, Sow-box of....J. Rushton et al
Skylight frame-bar and frame construction....C. M. Servatius
Sleigh....A. E. Taylor
Smelting sulfid ores....J. T. Carrick et al
Snow gathering and transporting machine....W. A. Warman
Sole-rounding machine....C. L. Allen
Sole-rounding machine....B. F. Mayo
Soling machine, Footwear-....J. Larsen
Spark-plug clip....C. A. Mezger
Speed-change mechanism....A. Balloco
Speed-indicator....R. T. Haines
Speed mechanism, Variable....H. I. Wilber
Spike-puller....J. B. Gillis
Spike-puller....R. A. Bradshaw
Spring-cushion....E. C. Washburn
Spring-wheel....H. E. Schindler
Springs, Machine for the manufacture of coiled....N. S. Harter
Square, Folding....A. G. Urban
Stacker, Swinging hay....R. J. Sparks
Stamp, Automatic time....J. Purdy
Stamp, Time-....F. Purdy
Stannic chlorid, Making....E. A. Sperry
Stapling mechanism....G. W. Church
Steam-trap....I. and E. Mayer
Steel....R. H. Illingworth
Steel, Hardening....W. A. Painter
Stool, Camp-....E. Huebner et al
Store-front construction....J. J. Bukre
Stove, Heating-....E. Scott
Stove or range, Cooking....E. Scott
Suction-machine, Centrifugal....C. Neumann
Switch-mechanism, Electrically-controlled....G. E. Palmer
Switch-stand, 2 pats....F. W. Snow et al
Switch-stand....W. C. Kidd
Tag....S. H. Brown
Take-down chair....J. M. Horton
Tape-line attachment....F. Schmidt
Telegraphone....J. A. Lieb
Telegraphones, Amplifying-magnet system for....J. A. Lieb
Telegraphones, Circuit-controlling device for....J. A. Lieb
Tenoning-machine, Vertical....J. R. Thomas
Tent-opening frame....G. V. Hanlon
Threshing-machines, Safety tooth-catcher for....C. G. W. Wernicke
Tire armor, Pneumatic-....F. Q. Cregier
Tire-pump....W. S. Stapley
Tire-remover....F. Hatton
Tires, Apparatus for inflating automobile-....A. J. E. Daffrin
Tobacco case and cutter, Pocket..A. B. Hadean
Tobacco-hanger....H. M. Lott
Toy....W. F. Mikolasek
Traverse mechanism, Rapid-....E. A. Muller
Trolley....F. E. Brazeal
Trolley-head....J. Lennox
Trolley-wheels and electric signal for the same, Restoring attachment for....G. H. Brooks
Truck-bolster hanger....W. G. Price
Truck, Car-....T. H. Curtis
Truck for harvesters, Tongue-...L. G. Johnson
Turbine....A. Jude
Turbine-motor....B. Stevens
Turbine, Steam-....W. O. Duntley
Twine-holder, 2 pats....F. W. Gibson
Type-writer tabulator....W. R. Fox
Type-writers, Apparatus for automatically operating....T. A. McCall
Type-writing machine....F. J. Dyett
Type-writing machine....F. A. Young
Type-writing machine....J. Felbel
Type-writing machine....F. H. Richards
Valve, Check-....M. W. Pitner
Valve-gear....J. Haase
Valve-locking means....J. Powell
Vehicle....C. H. Kramer
Vehicle brake, Automatic road-...R. J. Scheidt
Vehicle brake mechanism....R. Firth
Vehicle-fender....H. A. Suttle
Vehicle-top....O. E. and H. L. Burg
Veneering, Method of....W. J. Kelly
Ventilating system for rooms and the like....S. Timochowitsch
Ventilator....P. M. Egan
Vessel closure, Containing- 4 pats.E. D. Chellis
Vessels during ornamentation, Protecting the inside of....F. G. Farnham
Vestibule-diaphragm....J. H. Donaldson
Vine-cutter....W. E. Moldenhauer
Vote-registering machine....D. L. Newcomb
Voting machines, Counter-operating and locking mechanism for....C. C. Abbott
Voting-machines, Primary voting and vote-challenging mechanism for, 2 pats..C. C. Abbott
Wagon-brake....J. B. Jones
Wagon running-gear, Dump-....M. J. Todd
Walls, Building monolithic....H. H. Hahn
Warping-machine....G. L. Reed
Washing drinking-glasses, Machine for....W. A. H. Cameron et al
Washline-hanger....F. Ottusch
Water-heater....A. Shatzky
Water-motor....G. W. Spoelstra
Water-purifying apparatus..W. M. Jewell et al
Water-purifying apparatus....J. B. Fender
Water-tank....J. Chial
Water-tank, Return....P. J. Grahn
Wave-motor....F. M. Prather
Weather-strip....C. A. Pike
Weighing-machine, Automatic....T. Whitehorn
Well-drilling jar....C. M. Heeter
Well-tube and strainer....M. B. Van Ness
Wheel....M. D. Drake
Winding machine, Coil-....F. R. Kunkel
Window-frame....J. Lang
Wire-stretcher....M. A. Johnson
Wood-trimming machine....C. E. Brown et al
Wrapper for boxes and similar articles....F. Fettback
Wrapper for fruits....M. E. Woodard
Wrench....G. W. Mason
Wrench....J. J. Wise

DESIGNS.

Altar or shrine....P. Murphy
Badge....F. Persic
Bank, Pocket savings-....C. Fisher
Bottle....G. G. Durand
Bottle....C. W. Jones
Cap....M. Mattes
Display-cabinet....H. Heimann
Display-rack....J. A. Larson
Emblem....F. E. Mann
Emblem....G. H. Maisch
Hand-bag....J. L. Cutler
Incubator....A. L. Pinkerton-Gardiner
Lacing-hook....M. N. Bray
Match-box....J. J. Kwik
Plate, Decorative....A. J. Fondeville
Pottery jar....G. E. Patton
Shoe....S. Borchardt
Window-sill....M. P. McArdle

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MECHANICAL PATENTS.

Abrading or polishing machine....J. J. Canavan
Account-register....F. F. Dorsey
Accounting appliance....J. E. Wildman
Acid by means of superheating, &c., Manufacturing nitric....H. Pauling
Acid glycerin esters, Manufacture of salicylic....C. Sorger
Adding-machine attachment....H. R. Wellman
Adjustable bracket....W. G. Kirchhoff
Adjustable chair....L. C. Wentworth
Advertising-indicator....C. E. Johnson
Air-brake....W. V. Turner
Alarm....H. Irwin
Amalgamator....J. P. McGinn
Animal-trap....A. A. Hamilton
Animal-treating apparatus....F. C. Goff
Announcing or station indicator for railways and street-cars....W. S. Gunner et al
Arm-supporter, Adjustable....C. H. Dingman
Audiphone....O. J. Davy
Automobile-frames, Bearing for supporting radiators in....P. W. Noble
Automobile, Six-wheeled logging-..N. F. Coffey
Axle....E. P. Zahnter et al
Axle....O. Zachow et al
Baling-press....E. H. McMurry
Basket....M. A. Engel
Bath-tub-heating device....T. B. Jarvies
Beach-chair, Foldable....T. Krech
Bed, Invalid-....C. T. Joslin
Bed-spring....H. W. Pennepacker (Reissue)
Bed-warming device....W. H. Proctor
Beer cooling and purifying apparatus....V. F. Boehm
Bell, Swinging....W. P. and W. P. Elliott, Jr.
Bicycle, Water-....J. L. Henry
Binder-frame....F. Greiner
Binder, Loose-leaf....M. C. Neuner
Block-signal system....F. B. Corey
Blowpipe....G. Claude
Boat, Submarine....F. Mott
Bolt-heading die....W. F. Dowerman
Bonding-pin....F. H. Ayer
Book, Indexed....A. F. Dean
Book, Loose-leaf....A. Watters
Book, Manifolding sales-....C. M. Kirkland
Boots and shoes, Pattern for cutting out....J. J. Dumonceau
Boring and finishing device....T. W. Green
Boring apparatus, Safety....G. Burnside
Boring-mill....F. W. Parker
Bottle....G. E. Zeigler
Bottle....N. G. Burke
Bottle-cap, Combined metallic and frangible....F. T. Robinson
Bottle-capping machine....S. C. Bond
Bottle-cleaning machine....A. A. Pindstofte
Bottle-closure....W. H. Reid
Bottle-filling machine....L. Strebel
Bottle receptacle, Folding milk-..W. S. Weaver
Bottles, Glass-holding attachment for....W. K. Hopkins
Bowling-alley....W. W. Vearing
Box-fastener....J. A. Haugh
Box-lid support....N. H. Priley
Brake-head....C. B. Gosnell et al
Brazing....W. E. Gleissner
Bread and making same....C. E. Wait
Bridle-bit....H. H. MacNiven
Broom-moistener....L. G. Egger
Brush, Adjustable cleaning....R. T. Gillespie
Brush-holder....F. B. Howell
Bucket, Clam-shell....A. Ruetschi
Bucket, Grab-....C. Chase
Building-block and manner of assembling....R. A. Harris
Bung, Valve-....A. Schaper
Bunsen burner....G. Barthel
Burglar-alarm....C. Liaci
Butter, &c., Machine for cutting..J. H. Maurer
Cable-laying machine....G. W. Noble
Cable-reel....E. Rosenberg
Calculating-machine....W. F. Hausstein
Calculating-machine....C. M. Bernegau
Calculating-machine, 2 pats....W. F. Hausstein
Can-cap-placing apparatus....J. T. Wilmore
Can-cap-placing machine....W. I. White
Cap for the protection of the human head....R. Ireland et al
Car-coupling....A. Klinglesmith
Car-door hanger....T. S. Merriman
Car, Dumping-....A. G. Brown
Car, Railway passenger-....T. R. Brown
Car, Tram-....J. J. Schimpf
Cars or trains, System for automatically stopping....E. E. Kleinschmidt
Cars, Steel, underframing for railway-....F. L. Irwin
Carcass-scrubber....C. L. Smith
Carpenter's tool, Combined....B. Jacob
Carpet-fastener....J. C. F. Borger
Carpet-stretcher....T. E. Davis
Carriage, Baby-....J. E. Loshbough
Carriage, Child's....A. W. Loshbough
Carriage, Folding baby-....J. E. Loshbough
Carving-machine....F. H. Richards
Castings, Producing chilled....M. J. Somers
Cellulose, Method and apparatus for producing....A. Muntzing
Cement post....C. Hornshaw
Chain-galvanizing machine....E. C. Bull
Chamber, Extension....P. G. Hubert
Chandelier....W. T. H. Pauley
Cheese-press....E. L. McKinnon
Chocolate-making machine....W. E. Murray
Chuck, Planer-....L. H. Ginn
Churn....H. James
Churn and butter-worker, Combined....O. Christensen et al
Chute attachment for windows...C. R. Young
Cider-press....O. G. Haley
Cigar and cigarette holder....I. A. Heald
Cigar-machines, Wrapper-smoothing mechanism for....W. S. Luckett et al
Cigars and the like, Forming hygienic metallic end on....A. S. Van derMeulen
Cigars, Pressing....R. Woerner
Cigarette-machines, Paper-strip controlling and printing mechanism for....S. I. Prescott
Cleaning-tool, Pneumatic....C. Moukos
Clevis, Plow-....C. C. Rankin
Clip....R. W. Horton et al
Clip....W. F. Oakley
Clock, Graphophone-....C. W. Henrich
Cloth....G. Moss
Clothes-drier....M. P. Peterson
Clothes-drier....W. Scully
Clothes-pin....A. Stratton
Clothes-pressing machine....J. P. Replogle
Clutch....T. B. Rice, Jr.
Clutch, Friction-....A. Kingsbury
Clutch, Magnetic....R. Anderson
Coal and rock drill....H. R. Ford
Coal-pocket gate....A. Suck
Cock, Gage-....T. R. Whittaker
Coffee-pot....H. A. Pike
Collars, Stiffening-cape for coat-..J. W. Gray
Commutator for polyphase currents....A. Heyland
Concrete-mixer....J. D. Luttrell
Conduit construction....W. P. Day
Conduit-joint, Flexible....M. P. McLaughlin
Control system, Electrical-....H. D. James
Controlling-switch....H. E. White
Convertible and interchangeable seat....T. Scullin et al
Conveyor....J. T. H. Paul
Copy-holder....C. F. Ludington
Corking-machine, 2 pats....F. Barthold
Corn-sheller....J. V. Stradley
Corset and corselet, Combined....R. A. Whitehouse
Cotton-chopper....R. Henry
Cotton-chopper and cultivator, Combined....G. W. Sharp
Cotton-gin rib....T. A. Andrews
Crate....E. N. Davis
Crate, Sectional hog and poultry..C. E. Knight
Crates, Manufacture of....W. C. Yeomans
Crayon-holder....M. M. Gee
Cultivator....W. L. Paul
Cultivator and planter, Combined....H. H. and D. H. Enns et al
Cultivator attachment, Cotton-...A. H. Connell
Current-motor....J. Kirschweng
Current regulator, Alternating-..A. R. Everest
Curtain and pole holder....G. Walker
Cut-off, Automatic....W. P. Norris
Cycles, Two-speed driving-gear and free-wheel mechanism for....E. Sachs
Deck-plate....W. H. Durkee
Decorticating apparatus....T. E. Mitchell et al
Decoy, Folding....E. R. Rosentreter
Dental appliance....C. C. Galloway
Dental impression-tray....H. F. Smith
Dental instrument....W. B. Pearsall
Derailment-guard....F. Gehricke
Detector or feeler-point....A. E. Bostrom
Distilling apparatus, Wood-....W. Danner
Ditching-wheel....A. C. Heck
Door-check....J. Soss
Door-lock....D. H. Burtch
Drawing-press....H. J. Hinde
Drill-arm, Radial....H. M. Norris
Drill-boot....W. Houck
Drill-head and cutter-blade therefor..J. P. Karns
Driving mechanism, Variable-speed..R. M. Ruck
Eccentric, Shifting....H. Lentz et al
Egg-carton....H. W. Janicke
Electric apparatus, Vapor, 2 pats...O. O. Kruh
Electric furnace....E. Appleby
Electric furnace....A. L. Marsh
Electric furnace....H. L. Hartenstein
Electric heater....E. M. Hewlett
Electric machine, Dynamo-....J. P. Nikonow
Electrical-distribution system..R. N. Chamberlain
Electrical protective apparatus..J. A. Kenny
Electrical recording instrument..L. T. Robinson
Electrical resistance, Adjustable....F. O. Ball
Electrically-operated switch....H. F. Starrett
Electroplating apparatus, Basket raising and lowering device for....W. R. King
Elevator-retarding mechanism....A. J. Myer
Embroidery-hoop....G. H. Bixby
Engine igniting device, Gas-....J. V. Rice, Jr.
Engine starting device, Internal-combustion-..F. H. Walker
Engine-stop....V. J. King
Envelop....F. L. Richardson
Envelop-fastener....H. F. Manley
Excavating apparatus....W. C. Weeks
Excavating-machine, Sectional conveyer-frame for....A. C. Heck
Explosive-engine....G. W. Gibbs, Jr.
Explosive, Safety-....B. G. Resechke
Extension-table....F. L. and L. B. Rivard
Extension-table....P. Francis
Fabric, Machine for applying strips of tape to..R. E. Dodge
Farming implement....M. Abbott
Fastener....A. M. Clark
Fastening, Separable....C. C. Mund
Feeding device for draft-animals....R. L. Smith
Ferrochromium, Producing slag-free....J. B. Huffard
Filing-cases, Drawer-support for....P. H. Yawman
Filter-machine....H. W. Blaisdell
Fire-alarm system....H. H. Hillier
Fire and water proof composition, 2 pats....G. Kelly
Fire-escape....E. L. Flowers
Fire-escape, Balcony....C. J. A. Hanssen
Fire-extinguisher....J. C. Shafer
Fire-extinguishers, Head for automatic....L. E. Fagan
Firearm....H. H. Talbot
Firearm, Repeating, 4 pats....L. L. Hepburn
Firearms, Target-practice attachment for....J. M. Clark
Fireproof gravity-sash....F. F. Smith
Fish-hook....J. G. Henzel
Fishing-reel....F. Dümmig
Fishing-tackle sinker....E. A. Pflueger
Floor-surfacing machine....M. L. Schlucter
Flooring tongue-and-groove joint..J. W. Piver
Fluid-motor....C. Fr[illegible]
Flushing apparatus, Street-..D. Con[illegible]
Fly-trap....W. D. Fu[illegible]
Flying-machine....H. J. Cragin
Folder and corn-shock binder....F. M. Moss
Frame for mirrors, brushes, pictures and the like....R. R. Debecher
Furnace....H. Blum et al
Furnace....M. V. Smith
Furnace-grate....J. J. O'Brien
Furnaces, Stock-distributer and gas-seal for metallurgical....M. B. Parker
Furniture....W. J. Tingdahl
Furniture, Combination....T. J. Young
Furniture-spring....A. Weborg
Furrow-maker and fertilizer-distributer, Combined....W. O. Cumming
Game apparatus....O. E. Hurst
Garment-hanger....G. S. Stanton
Gas bracket, pendant, and the like..E. Sc[illegible]rin
Gas-burner Automatic....L. T. Burns
Gas-engine....C. O. Carlson
Gas-generator air-forcing means....G. P. Campbell et al
Gas lighting and extinguishing mechanism....G. Robson
Gas, Making....L. P. Lowe
Gas, Manufacturing, 2 pats....H. M. Pierson
Gas-manufacturing apparatus...H. M. Pierson
Gas-producing....H. Gerdes
Gaseous mixture having disinfecting and extinguishing properties, Apparatus for producing a....R. Marot
Gate....G. O. Kidder
Gate....O. H. Ahlemeier
Gate-operating mechanism....H. E. Williams
Gearing, Belt, rope, or chain..E. H. Hodgkinson
Gearing, Friction-....J. D. Baker
Glass, Producing....E. Morenus
Glue-applying machine....J. A. Butler et al
Go-cart....O. Kurz
Golf-practice apparatus....A. R. Sprague
Grain-separator....J. A. Neufeld
Grainers, Raking-machine for....G. B. Willcox
Gramophone....L. T. Haile
Grapple....L. T. Pedigo
Grate....C. Pekat
Grate, Oil-....R. Held
Grate, Sectional....D. J. Baker et al
Gravity-lock....G. Yunker
Gun-cleaner....O. P. Ward
Gun, Trap-....C. D. Lovelace
Guns, Target and bullet-catcher for use with air-....W. Baker
Hammer, Drop-....W. T. Sears
Harmonica, Reed-....J. E. Murphy
Harness for horse-training....H. Rasmussen
Harrow, Disk....C. S. Sharp
Harvester....F. Rump
Harvester and binder tongue-truck....J. Flaig
Harvester and husker, Combined corn....J. L. Allender
Harvester and husker, Corn....I. J. Ball
Harvester-reel and actuating mechanism therefor....G. V. Ratz
Hat, Washable....W. Neugass
Hay-loader....C. E. Clugston
Headlight-support....L. L. Lemay
Heating furnace, Air and water....C. A. Gibbs
Hides, Treating....F. R. Wessa
Hinge for window-screens....R. W. Carrington
Hog-trap....E. H. Nelson
Hoisting apparatus, Coal-....J. Campbell
Hoof-cutting knife....H. Andrews
Horses to and from vehicles, Device for attaching and detaching....F. E. Griffeth
Hose-clamp applier....D. Dubendorf
Hose-coupling....T. N. Jones
Hosiery....J. W. Mettler
Hub with ball-bearing, Wheel-....E. Sachs
Hydrant....C. J. Christensen
Hydraulic motor....B. F. Fowler
Hydrocarbon-burner....G. W. Reed
Ice-cream freezer....T. J. Fegley
Ice-cream freezer....T. L. Valerius
Incubators and brooders, Attachment for....W. E. Tredway
Indicator....H. F. Larava
Insecticide....H. C. Taylor
Insulator....L. W. Sorror
Insulator Strain-....W. C. Terry
Jelly-testing method and apparatus....J. Alexander
Lace fastener, Shoe-....M. B. Loller
Lacing, Temporary shoe-..J. W. Washburn et al
Lamp, Hydrocarbon-....W. Tures
Lamp socket, Plural-, 2 pats....R. B. Benjamin. (Reissue.)
Lamps, Device for automatic kindling of incandescent....J. Danischevski
Last....A. G. Fitz
Last-demonstrator....E. A. Eastman
Lead-press....D. Carlin
Letter-box alarm and indicator....O. F. Erickson et al
Lifting-jack....E. H. Z. Berge
Lightning-arrester....W. T. Goddard
Liquid-raising device....G. Waldmann
Lithopone and making the same, Non-darkening....I. P. Lihme
Load-holding device....A. L. Cox
Load-moving apparatus....F. Koch
Loading apparatus....T. S. Miller et al
Lock....C. Jensen
Locomotive....G. A. Bothwell
Log-dumping device....W. D. Link
Loom....H. Bardsley
Loom take-up mechanism....W. J. Lutton
Loom-temple....C. L. Joy
Low-water alarm....G. Woodall
Mail-bag catcher....D. S. Green
Mail-bag catching and delivering mechanism....W. H. Luker
Mail-box....W. W. Palmer
Mail catching and delivering device....C. C. Andrews
Mail-conveyer....F. E. Wolken
Manganese silicid, Producing....E. F. Price
Manhole-cover....H. del Mar
Marine boiler....H. E. Penney
Match holder, lighter, and cigar-cutter....J. Zander
Mattress-making machine....D. Haynes
Mechanical fountain....N. P. Metrofanoff
Mechanical movement....G. A. Humpert
Melon-carrier....W. A. Stark
Metal-shaping tool....S. C. Bond
Milk-cooler....H. C. Root
Molder's apparatus....S. Griffith

Mill-stock mixer and distributer, 3 pats.....F. C. Boynton
Molders, Presser-foot for irregular.....J. C. Burchill
Molding apparatus.....B. Horn
Molding-machine for cutting panels.F. Sanders
Motor-control, Induction-.....K. A. Pauly
Motor-control, Induction-.....E. F. W. Alexanderson
Motor control system, Electric-.....H. L. Van Valkenburg
Motor controller, Electric-.....T. E. Barnum
Motor controlling system, Electric-.H. D. James
Motor-frames, Suspension device for.....H. A. Knox
Motor-starting device.....M. J. S. A. Isnard
Moving device.....G. Fleischmann
Mowing-machine.....H. P. Johnson
Music-roll container, Perforated-.....J. B. Gaithright
Musical instrument, Pneumatically-operated.....T. P. Brown
Musical instruments, Key-striking mechanism for.....F. L. Young
Nail-pick-up device.....E. Lahl
Nets, Trip for hay-.....J. C. Calvert
Numbering-machine.....W. C. Downing
Nut-lock, Axle-spindle.....W. O. C. Ellis
Oil-burner.....O. B. Lyon
Organ.....J. Binnig
Package-tie.....T. Boyd
Packing, Shaft-.....G. Westinghouse
Paint and varnish remover and preparing the same.....L. Kramer
Paint, Fireproof.....P. F. Apfel et al
Painter's hook.....F. L. Rand
Papers, Liquid composition to be used in the manufacture of fancy stained...R. Schmicdel
Pasteurizing apparatus.....E. J. Miller
Pencil-box and book-support, Combined.....A. Schlager
Photographer's light-regulator....A. C. Novess
Photographic-printing apparatus.....A. C. Y. Macadam
Photographic-printing apparatus.....B. J. Hall
Piano-keys, Touch-adjusting mechanism for....W. M. Clemans
Piano-player treadle, Automatic.....F. W. Wright et al
Picture-border.....G. F. E. Pearsall
Pipe-union.....A. G. Anderson
Piston.....K. Matheus et al
Plant-receptacle, Electrical.....H. S. Latshaw
Planter.....W. B. Hampton
Planter, Corn-.....C. W. Sparks
Plow.....C. C. Rankin
Plow runner attachment.....E. E. Edwards
Plow siding attachment.....A. T. McIlwain
Pompadour-roll.....H. H. Taylor
Post.....J. H. Doddridge
Poultry-greaser.....W. W. Wilson
Power-transmission device....J. W. Lundgren
Printing machine, Web-.....W. Scott
Printing publication, Sheet to be used for.....J. W. Brooks et al
Printing-surfaces, Machine for producing.....A. Lyle et al
Projectile, Submarine.....T. Tucker
Pruning implement.....W. H. Gerfin
Pump.....J. Desmond
Radiator connection.....R. C. Evarts
Radiators, Steam-trap and air-vent for.....C. B. Thompson
Rail channels, Set for tramway-.F. O. Schneller
Rail-joint.....F. A. Collier
Rail-joint castings, Apparatus for molding.....J. H. Allen
Railway safety-indicator.....O. Stankey et al
Railway-semaphore, 3 pats.....C. W. Coleman
Railway signaling.....C. M. Jacobs et al
Railway-spike.....E. R. Miner
Railway switching device.....R. R. Miller
Railway-tie.....C. M. Phillips et al
Railway-track.....A. Rambacher
Railway-track structure.....J. O. Ulrich
Ratan canes, Method of and apparatus for striping weaving-strips from.....H. W. Temps
Razor, Safety-.....E. M. Quint
Razor-stropper.....A. H. Fleming
Receipt, Manifolding.....W. F. Blake et al
Refrigerator.....L. Hall
Reservoir.....T. J. Jackson
Resistance unit.....L. E. Barringer
Rheostat.....C. D. Knight
Rifle, Magazine-.....J. J. Catron
Rifle-sighting apparatus.....N. Aloyos et al
Ring.....D. F. Adams
Roasting-furnace, Mechanical..R. von Zelewski
Rotary engine.....J. Murray
Rotary engine.....W. M. Spencer
Rotary engine.....J. A. Eaton
Rotary engine.....J. L. Hopper
Rotary engine.....R. Lundquist
Rug corner-weight.....P. B. Ammerman
Running-gear.....M. W. Heyenga
Sad-iron handle.....J. H. Cox
Safe.....C. U. Carpenter
Safe and vault, Burglar-proof.....W. Brinton
Safety-pin.....A. W. Straight
Sand-blast, Hand-operated.....H. Mikorey
Saw-jointer.....C. R. Pierce
Saw-tooth, Insertible.....W. H. Askins
Scaffolds or stages, Attachment for swinging..W. B. Stoops
Scraper and conveyer, Combined.....L. Arms
Screw-eye driver.....T. J. Fegley
Steel, Car-.....H. C. Folger
Sealing cap, Bottle-, 2 pats.....L. Kalling
Sewer construction, 2 pats.....A. J. Galvin
Shaft-coupling.....A. H. Bommer et al
Shaft or journal box.....H. E. Norbom
Sharpener, Scissors-.....M. Henry
Shaving-cup.....C. M. Davis
Sheet-metal gutter.....S. D. Shoemaker
Shelf.....G. W. Curtis
Shelter-shed.....F. O. Cary
Shock-gatherer.....M. Ereckson et al
Shoulder-brace.....W. M. Elsen
Shovel and scoop.....B. Zimmel
Sign.....E. B. Wolfe
Sign, Electric.....S. E. Doane
Sign or the like, Advertising-....S. Krotoschin
Signal.....F. B. Corey
Signaling device.....S. C. Cart
Skate, Roller-.....T. J. Hruby
Skate, Roller-.....E. H. Copenhaver et al
Sled.....T. B. Poindexter
Smoke-consumer.....M. V. Moran et al
Smoke-house.....E. T. Malloy
Smoke-filtering attachment for pipes, &c.....C. W. Rowe
Snap-switch.....W. M. Scott et al
Sound-muffler.....J. S. and H. M. Hirsh
Sound-reproducing device, Hearing tube for...G. A. Lewis
Spark-timing apparatus.....C. C. Dodge
Speed-transmitting mechanism, Variable-.....A. J. Meyer
Spinning and twisting apparatus, Ring.....T. C. Powell
Spinning apparatus, Traverse-motion for yarn-.....J. Northrop
Spinning-frames, Drawing-roll cleaner for.....J. S. Deeley et al
Spout, Flexible.....J. H. Gilman
Spraying apparatus, Color-.....H. Mikorey
Spring structure.....W. R. Smith
Square, Try-.....J. F. McCurdy
Stamp-mill guide-block.....W. T. Byng
Stannic-chlorid solutions, Electrolyzing aqueous, 2 pats.....F. von Kügelgen et al
Steam-boiler, Oil-burning.....C. A. Hammel
Steam-generator.....H. Del Mar
Steel tank.....O. K. Harry
Steering device for power-boats....J. A. Garrett
Still, Water-.....A. R. Bailey
Stirrup, Safety-.....J. M. Hibbard
Stocking.....E. H. McColloch
Stocking-cap.....L. M. and H. E. Mills
Stone-drilling machine.....A. Weiss et al
Stone, Manufacturing artificial.....J. Staudt
Storage battery.....W. L. Merrin
Stove.....S. Boal
Street-sweeper.....J. Nelson
Stuffing-box.....F. M. Beamer
Suit-case, &c., Fastening for handles of.....F. H. White
Sustaining and propelling mechanism.....D. B. Littlefield
Switch actuating mechanism, Electric-.....H. B. Snell
Switch-stand.....W. W. Allen
Syringe.....T. H. Wallis
Talking-machine.....T. Kraemer
Telegraph and telephone pole seat, Lineman's portable.....C. T. Troell
Telegraph-keys, Strain attachment for.....W. H. Teachworth
Telegraph-poles, Device for attaching cross-arms to.....J. E. McGillivray
Telephone instrument.....C. E. Cole
Telephone system, Divided-central.W. W. Dean
Telescope, Panoramic.....H. Jacob
Temperature, Means for showing from a distance the variations in.....J. B. Fournier
Tent, Folding.....W. R. Diehl
Textile industry, Torrefying apparatus for the.....C. F. Kaisser
Thermostat.....C. J. Fox
Thill-coupling.....J. S. Shoemaker
Thill-support.....A. W. Perry
Thread-guide.....I. E. Palmer. (Reissue.)
Thresher, Traveling.....R. Sylvester
Threshing-machine.....G. Klein
Threshing-machine.....F. F. Landis
Ticket-holder.....E. Z. Wilkoshesky
Tile, Roofing-.....M. Marte
Tin cleaning and polishing machine.....B. H. Divine
Tin, Cyclic process of recovering metallic.....F. von Kügelgen et al
Tire, Pneumatic.....E. A. Marsh
Toe-weight.....M. Norton
Tootpick-boxing machine.....C. C. Freeman
Torpedo steering apparatus..A. J. Van Stockum
Torpedoes, Means for actuating submersion-rudders for.....A. E. Jones
Toy.....W. T. Wood
Toy engine, Electromagnetic.....H. G. Hawekotte et al
Trace-carrier.....W. E. Dippert
Traction-wheel.....A. E. Glascock
Transporting apparatus.....A. Suess
Trolley.....H. C. Reynolds
Trolley-harp.....F. M. Mudler
Trolley-wheel.....D. D. Grant
Trolley-wheel and sleet-cutter, Combined.....E. M. Schollenberger
Truck, Electrically-operated baggage-.....T. V. Buckwalter. (Reissue.)
Truck, Railway-car.....M. Kennedy
Truck side frame, Car-.....A. Lipschutz
Truck, Warehouse-.....R. S. Bergsather
Turning irregular objects, Machine for.....F. Hanses
Type-writer adding attachment....H. H. Burton
Type-writer carriage-shifting mechanism.....W. P. Kidder
Type-writer type-bars, Hanger for.....C. F. Crandall
Type-writing machine.....A. T. Brown
Type-writing-machine ribbon-reversing mechanism.....W. P. Kidder
Union.....H. E. Bullock
Union.....J. R. Steneck
Upholstery-pads, Table for manufacturing.....E. M. Hulse
Valve.....S. Matthes et al
Valve, Automatic shut-off.....G. A. Füllipp
Valve, Automatic stop-.....F. T. Reid
Valve, Automatic time-.....A. A. Shingleton
Valve, Bottle-neck check-.....M. J. Brown
Valve, Drainage-.....A. V. Knoll
Valve, Dry-pipe.....L. E. Fagan
Valve, Engineer's air-brake.....W. M. Austin
Valve, Engineer's brake-.....W. V. Turner
Valve, Fluid-controlled flushing-..R. A. Brooks
Valve for explosive-engines, Mixing-.....H. C. Fricke et al
Valve for sprinkling systems, Emergency-....C. A. Gray
Valve mechanism.....W. B. Wade
Valve mechanism, Pneumatic-..T. Vrana et al
Valve, Triple.....W. A. Weant
Valves and other uses, Reversing device for engine-.....K. C. Hoxie
Vehicle brake apparatus.....J. W. Taylor
Vehicle-coupling.....M. Turner
Vehicle-reach.....F. W. Bleckley
Vehicle-top.....B. H. Sheper
Vehicle wheel, Road-.....J. Slee
Vehicle-wheel, Shock-absorbing...H. R. Kumler
Vending-machine.....E. B. Baker et al
Vending machine, Bottle-.....A. J. and I. B. Alexander
Vibrator.....A. G. Gray
Violin.....J. D. Loppentien
Wagon, Chute-.....J. Campbell
Wagon, Coal-delivery.....J. Campbell
Wagon or other vehicle, Combination.....T. Carroll
Waist-lining, Form-fitting.....H. J. Baer
Washing-machine gearing.....H. Brammer
Water-closet flushing-tanks, Escape-valve for..C. and E. G. Pfau
Water-closet valve.....P. Haas
Water-cooler.....H. G. Cordley
Watermelon-carrier.....C. A. Woodward
Waterways, Apparatus for placing bed and bank coverings in.....A. Casse
Wave-motor.....W. E. Hillson
Weather-strip.....C. D. Tabor
Weed-cutter and cultivator.....O. E. Slayton
Weight-motor.....J. C. Rackley
Well screen, Water or oil..A. E. Childress et al
Wheel-assembling machine.....J. R. Welch
Wheel brake, Vehicle-.....B. F. Hornsby
Wheel mud-guard, Vehicle-.....W. E. Drake
Whiffletree.....G. F. Danielson
Winding machine, Twine-.....C. P. Mitchell
Windmill.....H. H. Macomber
Windmill.....B. E. Cassell
Window.....J. Emenaker
Window construction, Metal.....G. H. Forsyth
Window-screen.....F. Burckhardt
Wire-feed and nail-forming device...W. Wolfe
Wrapping-machine.....W. R. Williams
Wreck-indicator.....J. St. Antoine
Yarn, Manufacturing.....J. S. Butterworth

DESIGNS.

Automobile body.....C. Schmidt
Bag-fastening member.....C. Hiering et al
Bank, Pocket-.....B. vom Eigen
Bottle.....P. Garrett
Bottle.....C. H. Hermann
Fabric, Textile.....E. Sims
Plate or similar article.....J. W. Pointon
Rug.....W. A. Perry
Rug.....F. A. Haas
Spoons, forks, and similar articles, Handle for.....T. B. Lasher
Wall-covering.....J. N. Wiggin et al

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Abdominal and hernia pad, Combined.....M. A. and C. A. Snell
Account-register.....C. F. Fogg
Acid, Electrolytic production of chromic.....M. Le Blanc
Acoustic diaphragm, Mechanically-actuated.....M. R. Hutchison
Aero-tube.....W. Pars.
Alarm system, Electric theft-...J. J. O'Connor
Aluminium oxids, Manufacturing and treating composite.....M. Buchner
Ammon a apparatus.....J. Robson
Amusement apparatus, 2 pats..H. N. Ridgway
Amusement device.....A. G. Andrews
Amusement device.....H. N. Ridgway
Annunciator.....S. J. Heinrich
Automatic brake.....J. E. Frost
Automobiles, Latch for change-speed gears for.....E. L. P. Mors
Bag-frame fastener.....A. J. H. Kuhseik
Bag-holder.....R. V. Parr
Bail and hasp fastener.....O. G. Collier
Baking-powder.....F. Blumenthal
Bearing for driving and other shafts.....J. A. Wiggs, Jr.
Bearing, Roller-.....G. A. McKeel
Bed screen and table frame..K. C. MacMillan
Bed-spring.....W. W. Lytle
Bee-keeper's knife.....H. J. Porter
Beeswax, Bleaching.....A. Muller-Jacobs
Belt-guide.....S. D. Felsing
Bills and the like, Device for holding.....A. T. Kindwall
Blackboards, Tray attachment for.....J. W. Hainline
Blacking machine, Leather-.....L. Wimmer
Blower.....G. W. and W. H. Leiman
Blowing-engine.....P. H. Kane
Boat.....A. H. Friedel
Boat, Torpedo-.....E. A. Nilsen
Boiler water-gage, Steam-....E. F. Alexander
Bolt-cutting machines, Taper cutting and threading attachment for.....H. Neville
Book-holder.....H. B. Utz
Book, Indexed.....W. I. Harp
Boot or sock, Felt-.....F. W. Savage
Boring machine, Cylinder-.....W. J. Hagman
Boring mechanism, Rotary..J. A. Wiggs, Jr.
Bottle-holder.....A. C. E. Erichsen
Bottle, Indicating-.....W. C. Schmidt
Bottle, Non-refillable.....J. F. Arkenberg
Bottle-stopper.....H. Tuckmantel
Bottle-stopper.....O. Frocheur
Bottle-stopper.....G. Kirkegaard et al
Bottle-stopper.....H. C. A. Lütge
Bottle-stopper holder, Detachable.....D. B. Thompson
Bracket.....J. B. Macduff
Brake-applying device, Automatic train-.....A. W. Cavanagh et al
Brick-handling appliance.....O. Carlson
Briquet-machine.....K. Wessel
Broom-bridle.....A. T. Callahan
Broom-corn-treating machine....O. J. Wahler
Brooms, Dust-settler for.....E. A. Davis
Brush, Flexible.....B. G. A. Laitner
Brush for parquetry-flooring and the like.....J. Bruyère
Bucket, Dredger-.....G. Francis
Bushing, Pulley-clutch..J. W. McGregor et al
Butter-printing machine.....J. R. Prouty
Cabinet, Automatic seed-.....S. B. Powers
Cable terminal.....F. B. Cook
Calculating-machine.....W. F. Hausstein
Calipers, Measuring-.....J. W. Marr
Call-box.....H. S. Bullock, Jr
Camera, Photographic.....F. S. Andrews
Can-opener.....L. D. Jackson
Candlestick, Miner's.....M. M. Gault et al
Canoes, Invisible air-chamber and sponson for.....C. B. Thatcher
Car.....C. K. Pickles
Car for cement or concrete blocks, Transporting and drying.....S. M. Chase
Car frame, Railway-.....R. D. Gallagher, Jr.
Car grain-door, Freight-.....J. B. Smiley
Car loader, Box-.....F. D. Buffum
Carbon sheets, Means for mounting.....C. H. Megson et al
Carbureter.....M. D. Colbath
Carbureting apparatus.....H. E. Smith
Caster.....E. Lockyer
Casting apparatus.....M. C. Steese
Casting-machine.....R. B. Holley
Cellulose, Manufacture of.....E. Morterud
Cement mortar and making the same, Waterproof Portland-.....R. H. Gaines
Chair.....J. H. Brownell
Chair attachment.....I. W. McClanahan
Check.....J. C. Bell
Check or money-order.....J. C. Bell
Chimney or stack.....O. T. Benson
Clamp.....H. L. Wyeth
Clasp.....S. F. Estel
Clasp.....J. H. Pilkington
Cloth, Machine for extracting liquid from.....E. Gessner
Clothes-drier.....A. Baecker
Clothes-line holder.....C. W. Radoll
Clothes-pin.....F. F. Pecor
Clothes-sprinkler.....D. A. McClelland
Clutch, Friction-.....H. Lutz
Clutch mechanism.....C. R. Mabley et al
Clutch, Starting-.....J. F. Wilkinson
Coat-pressing machine.....A. W. Tindall
Coin-controlled apparatus.....T. S. Patterson
Collapsible box.....H. T. Brown (Reissue)
Collar, Dog-.....I. M. Bremer
Collar fastener, Horse-.....W. B. Estes
Combination-lock, Changeable....W. H. Taylor
Composing-machine, Record-strip.....J. S. Bancroft et al
Compressor.....E. W. Roberts
Concrete and the like, Machine for mixing....
Conduit, Sectional outlet-.....J. L. Kruger
Cooking utensils, Protective device for.....D. Elliott et al
Cooking vessel.....O. Lenschow et al
Coop, Folding.....G. E. Jackson
Cotton-chopper.....C. E. Smith
Cotton-chopper.....D. S. Ballance
Cotton-chopper.....W. B. Davis
Cotton-cleaner.....A. Rouquier
Covering articles with materials, Apparatus for.....C. F. Church
Crate, Folding.....B. Barker
Crate or box, Folding.....C. E. Sommers
Crate or case, Folding egg....G. E. Jackson
Crusher plate, head, and the like.F. M. Canda
Cuff-holder.....S. S. Fox
Cultivator attachment for thinning cotton.....J. W. Espich
Cultivator-frames, Means for attaching implements to.....W. E. Walden
Curtain catch or holder.....L. J. Berg
Curtain-stretcher.....J. Sines
Dental bridgework, Removable..E. C. Bennett
Dental cavity-impression tray....T. C. Trigger
Dental mouth-prop.....N. L. Polinger
Desk.....J. S. McComb
Detinning, Method of.....E. A. Sperry
Diaphragm.....W. H. Miller
Die-carrier.....R. Grieser
Dipper-handle.....O. H. Chandler
Distribution system.....D. Hall
Door-lock.....F. M. Merrill
Door, Swinging.....K. Metzker
Draft appliance, Differential..W. R. Campbell
Draft-equalizer.....F. Durgin
Draft-equalizer.....W. M. Wedeking et al
Draft-rigging, Bumper-beam...E. C. Washburn
Drag and scraper, Road.....D. McDaniel
Drain.....A. F. Denler
Drawer, Money-.....G. Therrien
Drying-boxes, Conveyer for....M. E. Dejonge
Dust-collector, Pneumatic.....W. F. Mahony
Eaves-trough and fastening therefor.....W. Feyler
Egg-testing device.....F. W. Gaylor
Electric-circuit coupling apparatus.....N. F. Niederlander
Electric-conduit fitting.....A. R. Lakin
Electric generator, Inductor.....P. Rabbidge
Electric machine, Dynamo-.....R. Siegfried
Electric machines, Brush and brush-holder for dynamo-.....F. H. Loring
Electric machines, Supporting structure for dynamo-, 2 pats.....R. Siegfried
Electric point shifting, signaling, locking, and switching apparatus, Safety device for....L. Kottmair et al
Electric switch.....A. L. White
Electric wires, Combined fused connector and lightning-arrester for.....F. C. Woods
Electrical line-protector.....F. B. Cook
Electrode for the recovery of metals from solutions by electrolysis.....S. B. Christy
Electromagnetic motor.....A. H. Beard
Elevator safety device.....J. J. Bennett et al
Engine starter, Explosive-.....C. C. Ilg
Envelop.....M. L. Walter
Envelop.....T. Gabriele
Envelop.....J. W. Carraway
Envelop.....V. McElree
Eyeglass-holder.....M. E. Dripps (Reissue)
Faucet attachment.....F. S. Davis
Feed-water heater.....R. Z. de Grau
Feed-water-heating grate.....E. C. Wilson
Felt-like substance.....D. Beatty et al
Fence-post.....L. H. Scott
Fence-post mold.....H. H. Rodgers
Fence-wire fastener.....W. H. Sullivan
Fertilizer-distributer.....W. B. Parrish
File, Bill-.....W. Molenaar
File, Paper-.....C. E. King
Finger-cot.....F. A. Corliss
Fire-alarm and signaling system..J. D. Nolen
Fire-brick and stove-top brace.....F. Jones
Fire-extinguisher, Portable..J. A. E. Anderson
Fire-extinguishers, Acid-bottle cage for.....J. M. Miller
Firearm aiming device.....C. Williams
Fireproof floor constructions, Centering for..G. B. Waite
Fluid-controller, Automatic.....M. M. Borden
Fluid-fuel furnace.....E. C. Voorheis
Fluid-pressure engine.....D. F. Smith et al
Fluorescence of fluorescent substances, Apparatus for exhibiting the.....W. G. Levison
Fly-catcher.....T. Kay
Fly-trap.....G. Komm
Fodder-cutter, 2 pats.....J. Dick
Freight-carrier, Gravity.....W. E. Courtney
Funnel.....B. R. Burg
Furnaces, Combustion and damper regulator for.....F. H. Brown

Galvanizing apparatus.....L. L. Gibbs
Garment and hook support..F. W. Selinsky, Sr.
Gas and coke, Making.....L. P. Lowe
Gas and separating gasolene therefrom, Cooling.....D. Hastings et al
Gas, Apparatus for making oil-.....H. Gerdes
Gas-burner.....H. A. B. Helander
Gas-engine.....G. A. Beaudet
Gas-engine, Air-cooled.....C. B. Kurtz
Gas-generators, Feed-regulator for.....C. L. Gerrard
Gas street-light extinguisher.....S. Wells
Gate.....F. E. Eldredge
Gear mechanism, Change-speed and reversing-.....L. A. Magout
Gear, Short-turning.....T. Sandstrom
Glove.....A. Newman
Governing mechanism, Automatic.F. H. Brown
Grain-conveyor, Pneumatic.....W. F. Carlton
Grinding-machine.....C. E. Ball
Grinding-machine.....A. B. Landis
Grinding-machines, Grinding-wheel truer for..A. B. Landis
Gun part, Mechanism for interlocking.....J. F. Beck, Sr.
Gyratory structure.....G. W. Combs
Harness-swing.....J. B. Reno
Harrow.....G. H. Wells
Harrow.....E. Swope
Harvester.....G. E. Shaw
Harvester and separator attachment.....B. F. Rogers et al
Harvester and shocker, Combined corn.....G. E., C. and R. J. Waller
Harvester cutting mechanism, Corn-.....F. M. Widerman
Harvesting sugar-cane.....H. G. Ginaca
Heel-scourer guard.....N. C. Bohr
Hook-setting machine, 2 pats.J. W. Barna et al
Hop-extracting apparatus.F. S. Davidson et al
Hops and yeast, Forming extracts from.....F. S. Davidson et al
Horseshoe-calks, Device for removing.....J. C. Lilly
Hose-bridge.....J. Fine
Hose clamp, Gas-.....W. H. Middlebrook
Hydrocarbon-burner.....G. Rehbein
Hydrocarbon-burner.....A. Akeson
Hydrocarbon-burners, Feed device for.....A. Akeson
Hydrocarbon-motor.....A. A. Low
Hydrogen, Generating....H. Foersterling et al
Ice-cream freezer.....M. A. Rowe
Ice-creeper.....J. Matteson
Illusory dramatic effects, Apparatus for producing.....N. Burgess
Inflating-mechanism indicating and controlling apparatus.....C. D. A. Pasteur
Insulated container for liquid air, &c.....J. F. Place
Insulator.....E. F. Padden
Insulator.....W. T. Goddard et al
Internal-combustion engine.....L. G. Cabathé
Key-lock for key-operated machines.....L. G. Julihn
Kneading and molding machine, Bread.....W. H. Wood
Lacing-hook-setting machine.....S. E. Taft
Lamps on vehicles, Device for automatically controlling.....J. W. P. Smithwick
Level, Spirit-.....G. W. Lingle
Level, Spirit-.....A. W. Hight
Level, Spirit-.....T. J. Mahoney
Lever, Power-.....W. W. Sutherland
Lifting apparatus.....V. B. Cahill
Lightning-arrester.....M. Berry
Lightning-arrester.....H. V. Bastin
Lightning-arrester, Security.....W. E. Drake
Line-holder.....F. S. Jolly
Linotype-machine.....P. T. Dodge
Liquid-heating apparatus.....A. T. Pfeiff
Lock.....W. Person
Lock.....N. Sahlsten
Locks, Electric alarm for.....F. M. Merrill
Locking-bolt for guards to openings.....C. W. McNeil
Mail-bag receiver and deliverer.....L. F. Kurpgeweit
Mail-holder.....T. A. Hill
Mailing-card, Pictorial.....A. M. Simon
Mangle.....L. H. Slaght
Manure loader and spreader, Combined.....F. E. Schee
Manure-spreader.....D. K. Wilson
Manure-spreader.....D. K. Wilson et al
Manure-spreader.....D. K. Wilson
Marker, Land-.....D. L. Smith
Masseur and medicator, Double..C. H. Murray
Measuring machine, Cloth-..C. G. Richardson
Merry-go-round.....A. M. Sweetwood
Metals and alloys, Apparatus for obtaining.....E. Viel
Metals and alloys by reduction, Obtaining.....E. Viel
Military defense, Portable barbed machine for.....K. Shiramine
Milk, cream, &c., Apparatus for cooling and ventilating.....A. T. Pfeiff
Miner's knife.....G. H. Landers
Mirror.....F. E. Bosworth
Mold for making florists' benches.L. Wittbold
Motor-cars, Device for carrying spare wheels or tires on.....A. J. Bailey
Motor controlling, Electric-.....H. D. James
Motor-machine steering-gear....H. B. Ditwiler
Multiple drill.....G. T. Reiss
Musical instrument, Stringed..H. Müller et al
Nail puller and starter.....B. F. Lindeman
Necktie slip device.....C. Reynolds
Newspaper-holder.....J. Ohsol
Nozzle for irrigating systems...E. L. De Long
Nut, Axle-.....W. W. Jones
Nut-lock.....G. A. Pattillo
Nut-lock washer.....E. Z. Wenrich
Nutcracker attachment.....J. F. Moy
Oil, 4 pats.....W. N. Blakeman, Jr.
Oil burner, Crude-.....J. N. Carter
Oil-gasifier.....W. H. Neher
Ordnance firing mechanism.....E. Schneider
Ore-separator.....J. E. Belt
Packing, Rod-.....O. J. Garlock
Padlock, 2 pats.....F. M. Merrill
Paint compound, 2 pats..W. N. Blakeman, Jr.
Paint compound and making the same, 3 pats.....W. N. Blakeman, Jr.
Painting machine, Wheel-.....H. P. Corbin
Pants-presser.....C. A. Nelson
Paper-coating machine.....C. F. Spaulding
Paper-holder, Toilet-roll-.....T. T. Graser
Paper-shell-making machine.....J. Chesney
Pencil.....C. A. Smith
Perforating-machine, Keyboard.....J. S. Bancroft et al
Perforating-machines, Rewinder for.....E. F. Littlefield et al
Phonograph-stop.....S. W. Gibbs
Photographic-printing apparatus, Continuous..B. H. Bragg
Photographic-printing machine.....C. J. Everett et al
Piano-actions, Implement for replacing bridle-tapes in.....G. W. Till
Piano-flange.....G. H. Campbell
Piano-tuning pin.....J. J. Bruer
Pianos, Detachable automatic action for.....E. A. Steel
Pie-tin.....E. O. Cook
Pigment compound and making the same....W. N. Blakeman, Jr.
Piles against worms, &c., Protecting.....P. T. Apfel et al
Pin.....F. P. Anello
Pipe-union.....E. Lienert-Market
Pipes, Adjustable trap for soil-..E. T. Barker
Pitchfork.....A. H. Knox
Plant-cutter.....S. F. Stoltzfus
Planter and fertilizer-distributor, Combined...G. S. Sheffield
Planter row-marker.....H. Shrader
Planters, Wireless attachment for check-row corn-.....J. Elder et al
Plow, Wheeled, 2 pats.....A. I. Weaver
Plows, Automatic releasing device for gang-..M. Joyce, Jr.
Pocket and garment-supporter, Combined....B. Ortell
Pole.....R. S. Orr
Police-call, fire-alarm, and watchman's-box, Combined.....J. G. Nolen
Post-brace.....C. Krabill
Potato-bugs, Means for gathering and destroying.....A. J. Buhler
Power-transmission device.....R. M. and M. C. Thornburg
Printing device, Blue-.....C. de Lukacsevics
Printing-machine, Automatic.F. H. Nelson et al
Printing-machine, Blue-.....C. Lukacsevics
Printing-press rotary folding mechanism.....H. P. Husby (Reissue)
Pump.....G. Sippert
Pump, Rotary.....J. F. Neville
Pump, Rotary.....G. Wilson
Pump, Stomach-.....J. F. Stallsmith
Pumping apparatus, Oil-well.....H. G. Bancroft et al
Rail-joint.....J. P. H. Bailey
Rail-joint.....R. B. Kennington
Rail-joint.....W. D. Williams
Rail-tie.....R. C. Nichols
Railway gate and signal, Automatic...F. Kroll
Railway-switch, Automatic..J. W. Sparks et al
Railway switch, Electric street-.....J. P. and T. P. Dowd
Ratchet-wrench.....H. E. Geffcken
Rats, mice, and other animals, Device employed for exterminating.....J. Barad et al
Reliefograph carriage-operating mechanism.....R. Grieser
Reliefograph feeding mechanism....R. Grieser
Road-bed.....J. L. Dickson
Rock-digger.....W. L. Combs
Rotary engine.....C. Gause et al
Rotary engine.....J. A. Leask
Rotary engine.....F. F. MacLean
Rotary engine.....H. C. Schaefer
Rotary engine.....A. E. Abbott
Rotary explosive-engine.....J. C. Walker
Rotation-indicating instrument.....H. C. P. Browne et al
Sad-iron waxer, polisher, and holder.....A. Solomon
Saddle, Harness-.....J. Y. Gray
Safety-pin.....J. E. Singleton
Sash-fastener.....J. M. Urick
Saw jointer and gage, Combined...E. J. Hicks
Saw, Rip-.....G. J. Schaller et al
Sawing machine, Segment-.....W. W. McKee
Scarf-pin-securing device.....I. Reiness
Scene-shifting device.....E. Giulietti
Scrubbing-machine.....F. Bicklein
Seal.....J. G. Swallow
Seal-lock.....L. I. Hamilton
Seam.....S. Borton
Seam.....S. Borton et al
Seat-iron.....G. W. Luke
Sectional case.....A. C. Abramson et al
Seed-dropper.....W. B. Parrish
Separating incombustible materials having different melting temperatures.....M. Leitch
Sewer-mold.....K. O. Guthrie
Sewing machine, Boot and shoe..M. T. Denne
Sewing-machine gage.....M. Fose
Shade-bracket.....L. Schachner
Shaft, Vehicle-.....G. F. Skelton
Shears.....C. Geis
Shedding mechanism.....W. W. Hubbard
Ship-cleaning apparatus.....A. R. Rogers
Shirt attachment.....V. Hansen
Shoe.....F. W. Homan
Shoe.....L. L. Bloomington
Shutter-worker.....A. S. Pierson
Sign, Illuminated.....J. Hotchner
Signal and train-stopping apparatus, Combination.....A. L. Ruthven
Signaling systems, Receiver for space.....L. D. Wildman
Skirt-supporter.....G. Wettlaufer
Sled.....W. J. Tolle
Smelting-furnace, Electrical..K. A. F. Hiorth
Soap, Manufacture of floating.....A. Stöhr
Soldering-furnace.....N. W. Lundy
Sole, Boot and Shoe.....O. C. Davis
Spark-arrester.....N. Martin
Sparking device.....H. Maillard
Spraying device for watering streets.....A. Thomas
Stable attachment.....S. R. Kimball
Stacker, Hay-.....S. E. Fowler
Stage apparatus.....N. Burgess
Standing-matter holder.....E. Domsgen et al
Station-indicator.....R. Toennes
Steam-generator.....H. E. Penny
Steam-generator.....G. W. Jessup, Jr.
Steam-meter.....C. E. Sargent
Sterilizing apparatus.....E. Kronman
Stopper-extractor.....E. Renkenberger
Stool and walking-stick, Combined camp-.....G. S. Sherwood
Stovepipe-hanger.....C. W. Shepard
Switch-actuating device.....N. F. Roadhouse
Switch-clip.....J. Clay
Tag-stringing machine.....L. A. McGrath
Telegraph-repeater.....S. D. Field
Terminal connector.....H. T. Johnson
Textile-spreading device.....E. Gessner
Ticket-case.....R. R. Clark
Tie-holder.....G. and C. Breeze
Time-recorder.....J. D. Smith
Time-recorder.....A. A. Newman
Time-switch.....C. E. Avery
Tin, Electrolytic production of pure.....A. J. M. Thirot
Tin-scrap, Apparatus for detinning.....M. Leitch
Tin-scrap, Detinning.....M. Leitch
Tin-scrap rending and shredding apparatus..M. Leitch
Tin-scrap, Treating.....M. Leitch
Tin-scrap-treating apparatus.....M. Leitch
Tire for vehicle-wheels, Flexible..C. C. Gouin
Tire-setter.....C. O. Pearce
Tire shield, Pneumatic-.....F. W. Savage
Toaster.....A. E. Traeger
Tobacco-stemming machine.....J. T. Carter
Toilet-comb.....W. S. Warren
Tool, Compound.....N. McAslan (Reissue)
Tool-handles, Coupling member for.....W. E. Smith
Toy.....J. Zimmermann
Toy.....B. B. Coleman
Toy-device, Campaign.....E. Wolff
Toy gun.....B. Hestness
Toy magazine-gun.....W. D. Raney
Tracker-bar, Shiftable.....A. Kuhle
Tracks, Curve for overhead.....A. H. Neller
Trains, Device for transferring parcels to and from moving.....A. J. Rudolph
Tramways, Self-adjusting sheave for cable-...H. G. Ferris
Trap-door.....L. J. Berg
Tree-holder.....F. Rauch
Trolley-harp.....E. J. Harrison
Trolley-harp attachment.....W. F. Savage
Trolley-pole mechanism, Automatically-tripping.....T. H. Mars
Truck side frame, Car-.....A. Lipschutz
Trunk.....T. J. McKay
Truss-braced tree.....B. F. Pinson, Jr.
Turbine, Steam-.....P. J. Hedlund
Type casting and composing machine.....J. R. Rogers
Type-machine.....J. S. Bancroft et al
Type-writer, Shipper's.....W. W. Frantz
Type-writer support.....W. E. Fetch
Type-writing machine.....J. A. Edlund
Type-writing machine.....C. E. Kelley
Type-writing machine.....J. C. McLaughlin
Umbrella, Collapsible.....J. Bellis
Umbrella-covering, Removable....M. E. Paris
Umbrella crown and runner.....H. C. Warfel
Umbrella, Folding.....M. B. Smith
Valve-action, Pneumatic.....J. Weiser
Valve, Drainage-.....C. C. Peck
Valve for filling-machines, Float-.....F. C. H. Strasburger
Valve for internal-combustion engines, Induction-.....R. E. Phillips
Valve for steam-engines, Emergency cut-off-..W. D. Ranney
Vault, Grave-.....W. A. Crew
Vault, Portable burial-.....F. C. Searle
Vehicle attachment, Motor-.....J. H., Jr., and G. J. F. Carpenter
Vehicle-brake.....A. E. Johnston
Vehicle-spring.....W. H. Smith et al
Vehicle steering device.....G. H. Young
Vending-machine.....E. P. Bruton
Vending-machines, Coin-controlled attachment for.....B. D. Campbell
Wagon-jack.....W. L. Preston
Wagon running-gear.....S. K. Dennis
Watch winding and setting mechanism.....H. Sandoz
Water, Apparatus for separating foreign substances from.....V. Antoine
Water-heater.....A. W. Schramm
Water-motor.....C. Weber
Water purifying and regulating means.....H. E. Sibson
Water-purifying system for swimming-tanks..G. D. Mitchell
Water treating, storing, and delivering apparatus.....M. Miller
Water-wheel.....J. R. De Remer
Weather-strip.....J. E. Scott
Weather-strip.....W. W. Withenbury
Weighing-machine.....G. Hoepner
Well-boring machine, Rotary..J. A. Wiggs, Jr.
Well-casing, Apparatus for screwing.....W. L. Dunn
Welt-dressing machine.....G. R. Cheesman
Wheel guards, Mud-shield for vehicle-.....G. W. Dunham
Wind-shield.....J. Webster
Window.....H. J. Davison
Window lock or latch.....E. A. Marsh
Window-screen.....B. C. Rockwell
Winker-blind.....W. L. Buerger
Wireless receiving instrument...F. C. Sargent
Wood-member joint.....F. A. Schossow
Wrench.....L. Chapman
Wrench.....J. Reif, Jr.
Yard-meter.....W. B. Schultz
Yoke fastening, Neck-.....W. W. Long
Zinc chlorid, Making.....R. R. Rust

DESIGNS.

Badge.....C. A. Winship
Bed-pan.....C. W. Meinecke et al
Bottle or flask.....D. W. Greig
Box.....G. A. Kruttschnitt
Chafing-dish and stand.....C. Nelson
Fabric, Textile.....H. Jacobson
Garment-clasps, Base-plate for..B. T. Wendell
Glass vessel.....O. J. W. Higbee
Lamp.....H. Saxon
Liquid-dispensing vessel.....L. G. Langstaff
Oven, Baking and warming.....L. Stockstrom
Tray or receptacle.....F. E. Barker
Type, Font of.....P. Terrell

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MECHANICAL PATENTS.

Accumulator-plate.....M. Margulis
Acetylene-generator, 2 pats.....N. Goodyear
Acid apparatus for beer-casks and the like, Carbonic-.....B. Hadank
Acids, Producing mixtures of sulfuric and nitric.....J. H. Nield
Adding-machine.....K. Karasek et al
Advertising apparatus.....H. Dahn et al
Advertising device.....G. C. Root
Air and gas compressor, Hydraulic.....G. P. Carroll
Air-brake-pressure adjuster, Automatic.....C. S. Smith
Air-brake system.....C. S. Smith
Air-compressor, Hydraulic.....J. H. Champ
Air or gas compressor system.....H. Keller
Alarm system, Automatic.....J. E. Shepherd
Albumin for the production of an article of manufacture useful in the arts and a product, Treating vegetable.....F. G. Weichmann
Albumin preparations, Manufacturing blood-..A. Langer
Amalgamator.....H. I. Seemann
Amusement apparatus.....H. N. Ridgway
Amusement device.....A. J. Northcraft
Anesthetics, Apparatus for administering.....C. K. Teter
Animal catching and holding tool.....E. L. Hitt
Animal-holder.....F. Chapman
Animal-trap.....W. D. Armstrong
Animal-trap.....G. Elsey et al
Animals alive during transportation, Keeping aquatic.....G. Erlwein et al
Automobile.....A. B. Shultz
Automobile brake and clutch operating mechanism.....C. Schmidt
Automobile fender and brake attachment.....J. O'Leary
Automobiles and other vehicles, Elastic securing device for doors of.....F. Charron
Ax.....C. A. Wilcox
Axle and bearing for grain-seeding machines..C. L. Fowle
Baling-press.....J. J. Stopple
Bail-thrower, Mechanical.....R. H. Lake
Bank, Savings-.....O. Burns
Barber's pole.....J. R. and A. R. Wygle
Barrel-head.....A. La Marche
Basket, Fruit-picking.....B. A. Swasey
Bearing, Ball-.....J. Schmid-Roost
Beds, Portable partition for....E. E. Hopkins
Belt, Power-transmission....G. Meacham et al
Bevel and square, Combined...S. G. Petterson
Bias-fold cutter.....E. C. Scates
Bicycle-wheel whereby it may be placed concentric or eccentric with axle, Means for mounting a.....A. D. Robbins
Binder, Loose-leaf.....F. A. De Graw
Blood compound of glycerophosphate of lime and calcium.....A. Langer
Boiler.....F. A. Ballin
Boot and shoe edge-trimming machine.....A. E. Ayer
Boring-machine, Thrust.....C. Christiansen
Boring-tool.....O. Tack
Bottle.....A. S. Kirk
Bottle.....H. S. Mitchell
Bottle-closure.....A. Adelson
Bottle, Fraud-detecting.....F. H. Waterman
Bottle, Non-refillable.....A. J. Grabel
Bottling-machine.....L. Jensen
Box.....W. Stewart
Box handle and fastener, Fuel and other.....T. E. Barton
Box-opener.....S. Stewart
Bracket.....A. L. Rice
Brake-beam.....W. H. Woodcock
Brush.....A. Herschmann
Brush-cleaner.....C. R. Spicer
Buckle, Belt-.....H. W. Fishel
Buckle guard, Harness-.....E. Jutras
Buckle, Harness-.....J. Reichert
Burner.....J. O. Morgan
Burner safety attachment..W. A. Caldwell, Jr.
Butcher's apron and frock, Combined.....W. C. P. Baldwin
Butter-cutting machine.....F. J. Zeigler
Button.....W. Raum
Button, Collar-.....C. A. Kieffer
Button, Collar and cuff.....E. C. Trees
Button, Tufting-.....J. W. Gunther
Cabinet.....C. L. Luthardt
Calendar and advertiser, Automatic.....W. L. Iuppenlatz et al
Cant-hook.....E. S. Menere
Car-brake rods, Detachable jaw for.....V. Willoughby
Car-chair.....S. J. Baxter
Car construction, Steel-, 2 pats..E. I. Dodds
Car-door.....S. G. Stapp
Car door-operating mechanism, Ore-.....C. G. Johnson
Car-door operator.....G. W. Rakestraw
Car, Drop-bottom.....E. I. Dodds
Car-fender.....C. R. Reeves
Car-fender.....J. Sweeney
Car grain-door.....J. Edman
Car-needle-beam attachment.....C. F. Frede
Car stake-tie, Railway-.....D. N. Bates et al
Car wheel, Mine-.....S. Wilkinson
Car-window.....E. S. Bucknam
Carbureter, Spray-.....P. A. Poppe
Card-mount.....J. N. C. Graham
Card-rack.....I. Hahn
Carriage driving mechanism, Motor-.....A. B. Morse
Case-hardening.....A. W. Machlet
Case-hardening apparatus.....A. W. Machlet
Cash-register.....T. Carroll (Reissue)
Castings, Remedying defects, such as blow-holes, in metal.....E. Wiss
Cement-block machine.....J. W. Miller
Chair fan attachment, Rocking-..W. Scheurer
Channeling-tool.....H. L. Rice
Charcoal-manufacturing apparatus.....C. J. T. Burcey
Check, Excess-baggage coupon-...F. H. Crump
Cherry-pitting machine.....J. W. Herbert
Cherry-stemmer.....R. G. Fontana
Chuck.....J. Wahlstrom
Circuit-breaker, Reverse-current.C. E. Eycleth
Cistern with purifier, Water-....W. J. Nuss

Clasp with pencil-chain for note-books, documents, or the like....E. Kapun
Clip....H. G. Addie
Cloth and the like, Automatic machine for folding....A. Bendien
Cloth winding machine....E. W. Blythe
Clothes-hook....L. Julig
Clutch, Friction-....V. M. Moore
Coal-storage plant....E. G. Volans
Coffee-pot....J. Armstrong
Coin-controlled apparatus....D. Wedgewood
Coke-drawer....D. Ferguson
Colors and the resultant article, Photomechanical reproduction of....C. G. Zander
Comb-cleaning device....W. T. Rice
Commutator-brushes, Penumatic holder for....C. W. Spiers
Composition of matter....W. H. Thrash
Compressor....B. E. Hill
Concrete construction for buildings, Reinforced....H. H. Wheeler
Concrete construction, Framing-support for....T. Corris
Concrete construction, Mold-plate for....E. G. Kemper
Concrete construction, Unit reinforcement for....R. A. Cummings
Concrete, Metal reinforce for..W. W. Ramsey
Concrete-mixing machine....R. T. Sollitt
Concrete-reinforcing bar....C. E. Johnson
Condenser....A. W. P. Cramer
Confectioner's heater....T. Chrul
Controller....E. W. Stull
Convertihle chair....J. Anderson et al
Convertible chair and table....C. H. Dixon
Conveyer, Pneumatic....C. L. Groves
Cooker, Fireless....A. T. Hallock
Cooking apparatus....W. Nash
Copals and the preparation of varnishes, Treatment of hard and semihard....H. Terrisse
Copper from a solution of copper, Obtaining pure....L. Jumau
Copper from its ores, Electrometallurgical process for extracting....L. Juman
Copper-making apparatus...M. A. Jullien et al
Cork-extractor....W. T. Vallandingham
Cork-puller....C. Deusch
Corn gathering and husking machine....N. M. Anderson
Corn-shock louder....G. Winemiller et al
Cotton-chopper....B. P. White
Cotton cleaner and distributer....R. L. Hollingsworth
Counter-irritants, Device for applying....E. M. Jefferson
Crate, Ventilated fruit-....O. E. Perigo
Culvert, Road-....J. Carey
Cuprammonia solution, Preparing....G. L. and A. Schaefer
Curling-iron, Electric....C. A. Rickards
Current contact apparatus, Automatic alternating-....C. E. L. Brown
Currycomb....C. F. Thompson
Currycomb, Reticulated....E. C. Gage
Curtain-fixture....P. A. Houghtaling
Cutting endless grooves or slots, Apparatus for....H. F. Packard
Cutting-stick....G. and R. Schwarz
Cylinder-lock....C. J. Caley et al
Damper, Flue-....F. M. Heath
Damper, Self-regulating....B. V. Croy
Dental-flask holder....F. Groshans
Dental plate....E. A. Jackman
Detachable handle....C. B. Post
Dibromindigo, Making....G. Engi
Die....F. E. Canda
Dirt or manure loader....J. A. Albrecht
Dish pan and drainer, Combined....M. V. Taggart
Display-receptacle....W. N. Aubuchon
Distribution system....L. L. Tatum
Ditching and grading machine..M. G. Bunnell
Door-fastener....L. C. Jensen
Door-hanger....S. W. Beeson
Door-operating mechanism....A. Campbell
Door or drawer securer....H. L. Fay
Door, Sliding....W. H. Mitchell
Drawing-board and drafting device..N. White
Drawing-press....P. M. H. Lange
Drawings, Apparatus for enlarging or reducing....E. O. Leighley
Drying-machine, Cylinder....J. A. Merrett
Drill....J. F. Mitchell
Drill and auger gage....G. E. Stanford
Drill-head and bit or cutter....M. Hardsocg
Duster....J. F. Dwyer
Egg-whip....F. Genge
Electric alarm for beds to be occupied by patients, such as hospital-beds....F. Apold
Electric-light socket....F. Frankofski
Electric lighting....W. C. Fish
Electric machinery, Dynamo-....C. A. Parsons
Electric signal....A. J. Cleveland et al
Electric time-switch....J. J. Coachman
Electric transmission of intelligence, 2 pats....I. Kitsee
Electrical connector....J. L. Carnall
Electrode, Arc-lamp....W. S. Weedon
Electrolytic cell....A. S. Gray
Embroidery-hoop....F. E. Kohler
End-gate....C. H. Polk
Engines, Electrical-ignition spark-coil for gas or vapor....E. O. Williams
Engines, Ignition mechanism for internal-combustion....T. S. Bailey et al
Engines, Means for distributing water to water-jackets of multiple-cylinder..V. J. Emery
Engines, Reversing device for internal-combustion....E. A. Rundlöf
Envelop....W. W. L. Longtoft
Envelop....E. Cowen
Envelop-machine....T. W. Kienast
Evaporator....G. H. Grimm
Excavating-machine....F. J. Monahan
Exhauster and compressor, Motor-driven....M. D. Compton
Explosive-engine....H. L. F. Trebert
Fan and fly-catcher, Combined..F. M. Schmidt
Farm-gate....J. J. Thompson
Fastener....C. A. Conrard
Fastening device, Detachable....L. Rossi
Fastening device, Metal....S. E. Ward
Feed-water heater....G. Wilkinson
Feed-water heating and purifying system....J. W. Gamble
Feeding mechanism, 2 pats....T. W. Kienast
Fence-making machine....D. P. Malone
Fence-post....J. McInnis
Fence-post....G. W. Pyle
Fertilizer-dropper, Hand....J. T. Flippen
File and index....W. O. Gottwals
File, Paper-....H. Herdegen
Filter....C. A. Youngman
Fire-alarm....A. S. Trask
Fire extinguisher and alarm....C. M. Bowman
Fire-resisting shutter or curtain....A. Rush
Firearm, Hand-....K. A. Bräuning
Firearms, Cleaner-rod for....H. Suva
Fireplace screen, Open-..H. N. L. Sherman et al
Fluid-mixer....C. Gambee
Folded-blank box....G. L. Morrison
Food product and making the same....J. E. Bloom
Fruit and vegetable drier..F. D. Kendall et al
Fruit-cutter....E. G. Chatain
Furnace....A. Smallwood
Furnace-grate....J. M. Blades
Furnaces, Supply and control of air for boiler and other....W. S. Hubbard
Furniture, Interlocking end iron for sectional....G. W. Vosmer
Game apparatus....J. F. Hughes
Game score-card....E. M. Sheeran
Garment....H. M. Mayper
Garment-clasp....J. H. Pilkington
Garment-fastening device....F. Weckerly
Garment-hanger....M. H. Cazier
Garment-supporter....B. M. Richardson
Garment-supporter....B. Newton
Gas-burners, Auxiliary pressure-regulator for....H. Farnoff
Gas-engine....J. H. and J. H. Birch
Gas-furnace....C. P. Hensley et al
Gas-generator for explosive-engines....H. K. Shanck
Gas-producer plant....C. Whitfield
Gate....W. H. Mitchell
Gate....C. Hill
Gate-fastener....W. N. Faverty et al
Gear-cutting, planing, and milling machines, Attachment for....S. A. Hand
Gearing for traction-wheels, Yieldable....L. Rhodes
Gearing, Variable-speed....S. T. Lewis
Glass-furnace and appurtenances thereof....H. M. Brookfield
Glove....J. W. and R. F. Taylor
Glue, Manufacture of....I. Kitsee
Gold-separating apparatus....J. A. Creasy
Gold-washing screen....W. H. Roughsedge
Grab-hook....J. E. Flynn
Grain-distributing apparatus..H. P. Harpstrite
Grain-heater....F. A. Spivak
Graphophone and picture-exhibitor, Combined....C. W. Taylor
Greenhouse construction....J. H. Rice
Grinding and polishing machine....L. A. Jones
Grinding-machine case, Portable...G. Wieber
Grinding or erushing foundry-sand, &c., Apparatus for....P. Bonvillain (Reissue)
Grinding or crushing mill....J. J. Fraser
Gun-cleaner....G. A. Swazey
Gyrating machines, Means for facilitating the adjustment of balance-weights on....L. V. Rathbun
Hair-crimper....J. F. Martin
Hame-strap attachment....H. G. Spraker
Hammer, Pneumatic, 2 pats....M. Hardsocg
Hanger-rack receptacle for clothing....W. S. Gilmore
Harrow and plow, Combined....B. F. Aplin
Hay-rack....P. C. Jackson
Heat-deflector....F. R. Bigler
Heat-regulating apparatus....D. H. Haywood
Heat-regulating apparatus....V. F. Davis
Heater....W. K. Stafford
Heating and lighting apparatus, Gasolene....T. J. Forde
Heating apparatus, Air-....F. W. Green
Heating-furnace....C. A. Robinson
Heating systems, Regulating device for steam-....J. F. McElroy
Hinge, 2 pats....R. G. Winter
Hinge, Gate-....C. A. Johnson
Hinge-joint....I. L. Kiser
Hinge, Screen-....W. Gossett
Hitching-post....C. Butcher
Horse-bit....J. Gaertner
Horse-check....N. Stalker
Horseshoe....J. B. Raban
Hose-coupling....M. P. Eagan
Hose-coupling....A. A. Minorsky
Hose-coupling, Air-brake....J. E. La Rocque
Hot-air register....W. R. Knights
Hydraulic jack....F. F. Ashmore
Hydraulic motor....J. H. Rose
Hydraulic motor....W. C. Obernesser
Ice-cream-can attachment....L. A. Carroll
Ice-creeper....P. F. Lefebvre
Identifying articles and such identified article, Method of....J. M. Boyle
Incubator-alarm....F. R. Harris
Incubator-heaters, Lamp-support for....C. Z. Davis et al
Indicator and alarm, Combined....J. A. Noel
Indicator-lock....E. F. Wells
Influence or condenser machine, Electrical multiple....H. Wommelsdorf
Insect-catcher....C. W. Kronenberg et al
Insect-destroyer....G. W. Darnell
Insole covering and shaping machine, Reinforced-....W. C. Stewart
Insulator....E. J. Forcman
Insulator-support....C. L. Peirce, Jr.
Iron, Electrodeposition of..S. O. Cowper-Coles
Ironing-board....E. L. Ridgway
Jig, Machinist's....B. P. Fortin
Journal-bearing....A. L. Streeter
Knife-handle....W. I. Morton
Knitting-machine take-up device, Circular-....H. A. Houseman
Lacing-hook-setting machines, Clutch mechanism for....S. E. Taft
Ladder....H. Adler
Ladder....W. Jones
Lamp....F. W. Kearsey
Lamp-bracket....E. M. Rosenbluth
Lamp controlling attachment, Heating-....L. W. Holmes et al
Lamp, lantern, and heater....H. A. Watkins
Lamp, Miner's....C. Murray
Lamp socket, Cluster-....R. B. Benjamin
Lamp socket, Electric-....M. Norden
Lamps, Working of electrie vapor-....R. Küch
Last....W. H. Hooper
Lathe for billiard-cues or the like....M. E. Dannenberg
Lathes, Feed mechanism for wood-turning....C. H. Waymoth
Level....A. A. Loveless
Level, Spirit-....C. T. Ridgely
Lewis....P. Neddo
Life-preserver....H. W. Fraser
Lifting device....W. H. Huttinger
Lighter....A. E. Caughey
Line-casting machines, Galley for....D. S. Kennedy
Locking device....A. M. de Oca
Locomotive-boiler....J. J. Gage
Locomotive sanding apparatus....A. O. Martin et al
Locomotives, Train control for electrie accumulator-....O. Böhm
Loom, Hair-fabric....B. Knittel
Looms for weaving, Dobby for....H. Schwarzenbach et al
Lubricator....A. Winton
Mail-bag catcher and deliverer..G. W. Harris
Mail-bag catching and delivering apparatus....N. J. Nelson
Mail-bag deliverer....J. F. Black
Mail-carrier....R. Chapman
Mail-handling apparatus....W. C. Thornton
Malting apparatus....E. G. Adlam
Manhole-lid....H. A. E. Liebert
Manifolding apparatus....C. W. Byham
Manifolding device....A. T. Moore
Mantle-burner....R. M. Dixon
Massaging-machine....C. A. Manker
Measuring and cutting skirts, Machine for....C. P. Leyner
Measuring device....E. O. Engberg
Measuring-mold....A. T. Moore
Measuring the areas of surfaces, Thickness-measuring attachment for machines for....J. Robertson et al
Measuring the thicknes of leather and other sheet material, Instrument for....J. Robertson et al
Merchandise-bin....I. D. Warren
Metal box....G. Klenk (Reissue)
Microscope....J. H. Ford
Milling-machine....V. I. Wahlstrom
Mirror, Laughing-....H. Schuessler
Mirrors, brushes, and the like, Frame for....R. R. Debacher
Molding-machine....H. Sonnenberg
Moldings, Machine for producing....P. Lorentzen
Motive fluid from the combustion of fuel, Means for producing....W. J. Renshaw
Motor....J. H. Champ
Motor controller, Electric-..T. E. Barnum et al
Motor-starter....A. J. Horton
Mowing-machine....C. W. Robinson
Music-playing mechanism, Modulation-indicator for automatic....W. S. Denton
Music-sheet turner....R. L. Kennon, Jr.
Musical instruments, Traeker or bridge for self-playing....L. H. Maier
Nail forming and driving machine....H. H. Cummings
Necktie-press....S. Miller
Nest, Hen's....J. Muhl
Newspaper-holder....K. Sjoberg
Note-sheet....P. Riessner
Nozzle-holder....J. J. Meskill
Nut-feeding mechanism....R. J. Rodd
Nut-lock....R. H. Bowman
Nut-lock....J. R. Goode
Nut-lock....J. W. North
Nut-lock....I. Barker
Nut, Lock-....G. W. Boyd
Nut-retaining device....P. H. McTigue
Oil-can....C. D. Daymude
Organ....E. de Kleist
Package....G. H. Patterson et al
Package-box....I. J. Kuert
Packing for piston-rods, valve-rods, and the like, Metallic....W. Harbinger
Pail cover, Milk-....M. C. Mason
Paper bag....R. Geldmacher
Paper tubes, Machine for the production of....J. Gohy
Paper vessel....C. T. Bloomer
Patrol-box for watchman's time-keys....A. A. Newman
Pen for holding swine....J. C. Mabbott
Pens and pencils, Pocket-clip for fountain-....A. K. Watts
Phonograph....H. Schröder
Phonograph-machine, Multiple....J. Roever
Phonograph registering mechanism, Multiple-..J. Roever
Phonograph-reproducer....H. Baldwin
Photographic cartridge-film, Flexible....F. W. Lovejoy
Photographic-printing apparatus..J. W. Vickers
Photographic-printing apparatus..T. T. Sabroe
Piano, Manually and pneumatically operated automatic....J. W. Davis
Piano-pedal....E. P. Sedgwick
Pianoforte-case....J. A. Hussey
Picture-frame corner-piece....C. C. Faucette
Piling, Interlocking sheet-metal....S. T. Fiero
Pipe bends, fitings, &c., Machine for finishing....H. W. Evans
Pipe-wrench....F. T. Lestage
Placket-closer....J. L. Brassington
Planing machine, Cask-....L. Drexler
Planter, Corn-....W. S. Hasleu
Plate or film holders, Device for closing....R. Schüttauf
Plow....H. W. Via
Plow....M. C. Jordan
Plug, Plumber's testing-....J. F. Brunner
Pneumatic and other drills....M. Hardsocg
Pole....D. W. Krellwitz
Post-hole digger....J. H. Lowry
Potato digger and separator....J. Halbardier
Pottery and other ware, Apparatus for decorating....F. Mountford
Power-generating system....J. M. W. Kitchen
Power-transmission device for motor-vehicles..F. C. Avery
Precipitates, Purifying....H. H. Dow et al
Pressing-iron, Gas and air....H. A. Koenig
Printing-machine....J. L. Firm
Printing-press....G. Hartman
Printing-press....H. F. Bechman
Printing-press, Mechanism for raising and lowering platens of....M. J. Barnett
Printing-press....J. H. Stonemetz
Propulsion of ships....E. J. Duff
Protractor and level, Combined..H. E. Gregory
Pulley-block....A. Opsal (Reissue)
Pump....G. W. Curvin
Pump....W. von Oechelhaeuser et al
Pump attachment....J. Chan
Pump for explosive-engines, Oil-..W. K. Andrew
Pump, Gear-....J. G. Callan
Punch....W. Carman
Radiator for hydrocarbon and other heat motors, Heat-....K. J. Steiner
Radiator, Sectional....J. M. W. Kitchen
Rail-joint....S. Enderle
Rail-tie....C. A. Murphy
Railway-rails, Device for preventing the creeping of....J. Schuller
Railway-signal....C. D. Deardurff et al
Railway-signal....J. S. Sims
Railway signalling system, Electric-....H. N. Lapey
Railway switch, Street-, 2 pats...P. McGrath
Railway system, Third-rail electric-....C. Kozesnik
Railway-tie....A. S. Topping
Railways, System of automatic bloek-signaling for electric....W. K. Howe
Reactive coil....C. P. Steinmetz
Receptacle, Hermetically-closed....W. M. Brownlee
Refrigerator....T. A. Mayer
Refrigerator....J. C. Tyler
Register-backing and damper, Combined....J. C. Hendrickson
Reinforcing-frame and cementitious construetion....A. P. White
Resilient arm....E. J. Ryerson et al
Revolver....W. G. Zaister
Rolling-mill....A. T. Keller
Roofing, Sheet-metal....H. E. Moomaw
Rotary engine....J. Knowles
Rotary engine....H. Pieree
Rotary engine....G. W. Hopkins
Rug-fastener....W. A. and C. M. Alden
Rule, Calculating-....W. S. Harlow
Rule with spring-joints, Folding...E. Zweigler
Salts or compounds, Electrolysis of fluid....H. S. Blackmore
Sap-cup support....C. Varnadore
Sash-chain fastener....J. H. Sayres
Sash-cord guide....J. M. Martin et al
Sash-fastener....T. Wertz
Sash-holder....A. H. Marden
Sash lock, Window-....M. H. Gaba
Sash-weight, 4 pats....F. C. Schwedtman
Saw-set....A. Johnson
Saw-tooth-shaping device, Swaged-....E. P. Armstrong
Sawing-machine....F. N. Trevor
Sawing machine, Shingle-....J. G. Pike
Sawing machine, Timber-....J. M. Martin
Sawing machine, Tree-..W. T. Christine et al
Sawmill....J. Ihle
Sawmill set-works....N. E. Rice
Scenery in theaters, Mechanism for shifting stage-....G. Schneider
Scissors or shears....S. F. F. Lindal
Screen....B. Goodman
Sealing machine, Envelop-, 2 pats....C. J. Fancher et al
Separator....J. E. Purser
Sewing-machine, Hemstitch....M. Hemleb
Shade bracket, Window-....F. Hannemann
Shade-fixture....D. Whinery
Shade-making machine, Window-, 2 pats....E. O. Engberg
Sheet-metal-coiling machine...W. H. Carpenter
Sheet-metal, Corrugating....H. F. Cobb
Sheet-metal-scouring machine..W. H. Carpenter
Sheet-metal strips, Machine for cutting and mounting....W. Stuebing
Shovel....J. W. Ellison
Show-case....S. J. Lindskog
Shutter-worker....J. Norton
Sign, Talking-....L. R. Paige
Signaling mechanism, Automatic....J. Reuter
Skate....C. Wall
Skylight and its sash-bars, Ventilating....H. E. Hersh
Slag, Treating blast-furnace....F. W. Wood
Sled....N. Highland
Smoke-consuming furnace....P. Rielly
Smoke-conveyer for railway-trains....R. L. Rhodes
Smut-machine....O. L. Larson
Sole-pressing machine....W. Frasier
Soles of wood, Machine for pinning leather on....W. Schou and H. Busse
Sound-reproducing machines, Hearing-tube for....G. A. Lewis
Sounding apparatus, Sea-....M. T. Parks
Spark-arrester....J. E. Dempster
Speed-changing meehanism....W. O. Foss
Speed-controlling device....C. I. Longenecker
Speed indicator and recorder....F. F. Uehling
Spindle, Silk-throwster....F. Bryant
Spur, Riding-....W. D. Miller
Square, Folding....H. D. Buys et al
Stage effects, Means for producing theatrical..G. W. Hanlon
Stamping machine, Envelop-..H. W. Buehanan
Stanchion, Cattle-....W. Gutenskunst
Staple-tacker....M. D. Phelan
Steam-engine....R. E. Dean
Steam-engine....J. N. Leach
Steel, Hardening and toughening....J. Churchward
Steels, Producing alloyed....J. Churehward
Steering-gear for ships....H. Penton
Stirrup, Safety-....S. P. McTigue
Stitching, Machine for doing openwork-....M. Gould
Stone-saw....J. S. Young
Stool, Sewing-maehine....J. Liden
Storage battery....H. H. Carpenter
Straight-edge....C. T. Ridgely
Stuffing-box....F. A. Dailey et al
Superheater....E. H. Foster
Support and power mechanism, Portable....J. C. Steiner
Surfacing-machine head....J. F. Stoll
Surveying instrument....F. A. Waugh
Suspender-connector, Adjustable..A. T. Moore
Swaging seamless crowns, Press for....W. G. Bridge
Switch-point loek....G. B. Blevins
Switch-stand....W. W. Scott
Switching device....J. A. Duffy et al

Table-pad....F. A. Brunke
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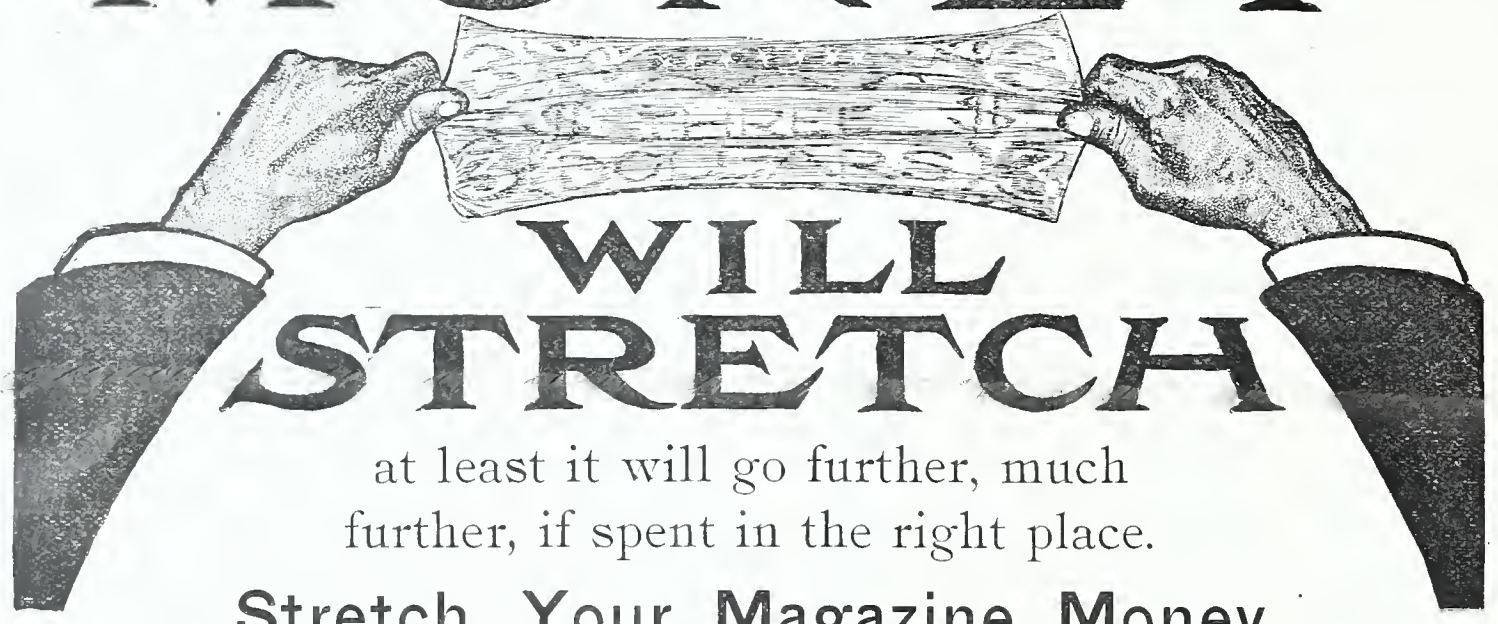
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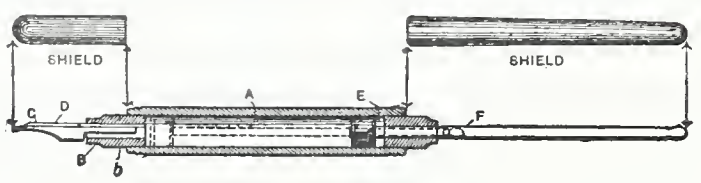
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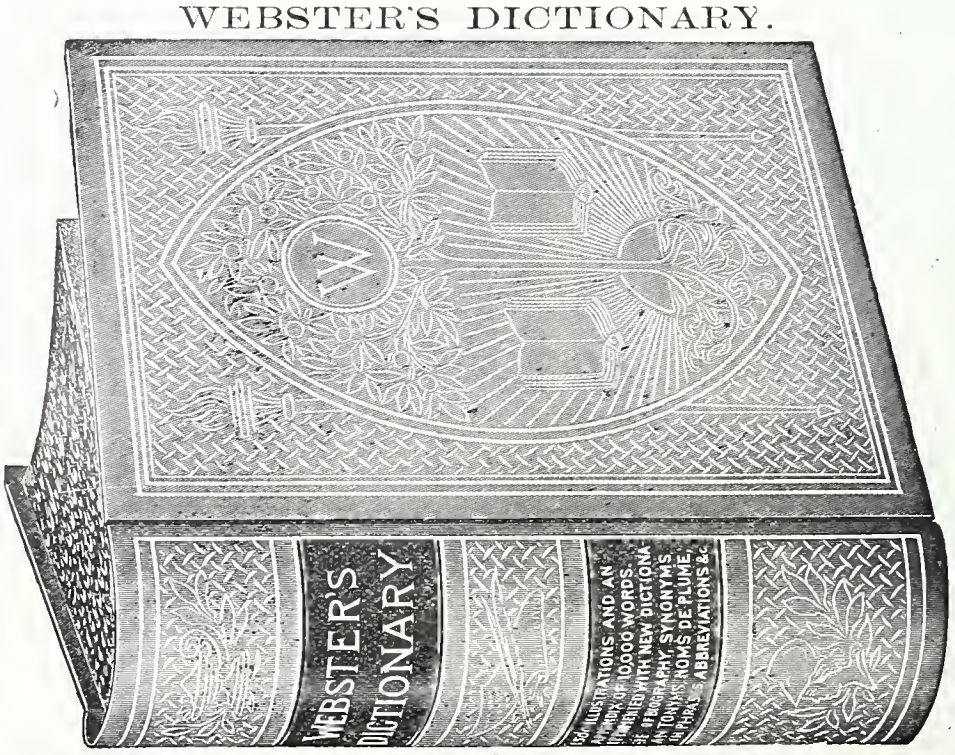


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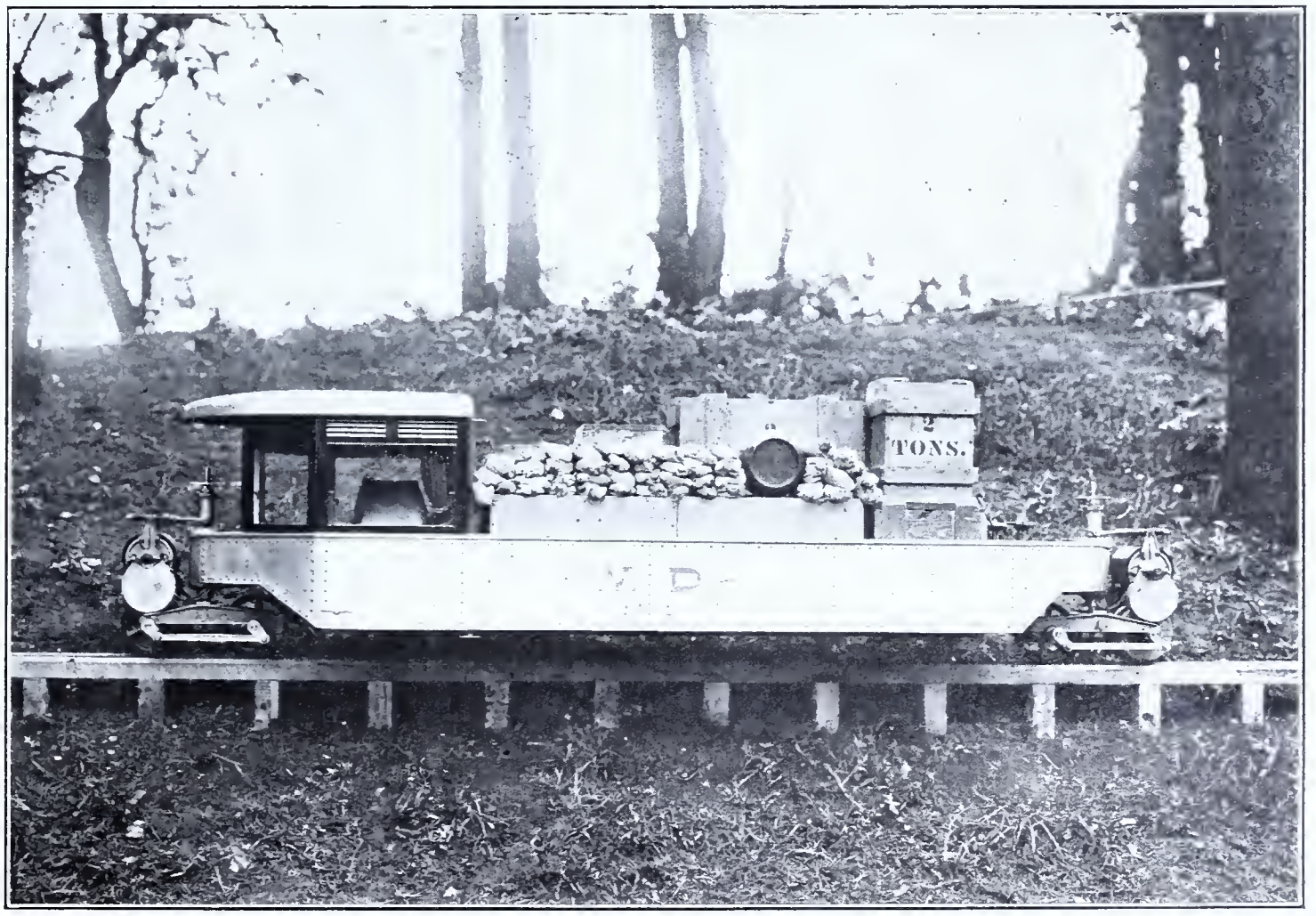
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THE GYRO-MONORAIL.

By E. OMMELANGE.

AN account of this novel device appeared in the INVENTIVE AGE for September; but as this invention promises to revolutionize the traffic of the world, the following additional details will be of interest. There is now no real monorail line in existence. Visitors to the St. Louis Exposition may remember a model there shown of a car which was adapted to run on a single rail, straddling it, as it were. This was for a railway projected between Manchester and Liverpool, England; but it has never been put into operation. There is also a so-called monorail in Germany, in which the cars are suspended on a cable, but this is quite expensive, and both the above mentioned devices are entirely different from the Brennan railway, as neither uses the distinctive feature of the gyroscope.

The model car, as seen in the cut, somewhat resembles a large pontoon or barge in shape. Part of the inside is arranged for passenger accommodation, and part for goods. The car is carried on two bogies, one at each end, so pivoted that they allow the car to turn easily on curves. It is claimed that the vehicle can run upon curves of even less radius than the length of the car itself, or on crooked rails, or on rails laid upon uneven ground, without any fear of derailment.



THE BRENNAN RAILWAY.

The car, as noted, is carried on four wheels. Each pair of these wheels is coupled, and one in each set is driven direct through gearing from electric motors carried on the bogies. The power of propulsion is derived from a number of small secondary cells placed inside the car. But by far the most interesting part of the carriage is the means adopted for maintaining equilibrium, for it must be at once apparent that the center of gravity of the car is much higher than the center of buoyancy, and consequently it is an unstable body. To overcome this the inventor has introduced two gyroscopes mounted on bearings which run in a partial vacuum. These gyroscopes work in a vertical plane and run in opposite directions: they are connected together by suitable gearing so that their peripheral velocities are equal. This arrangement overcomes the difficulty which would be experienced in turning were they not so constructed. So beautifully is the mechanism adjusted that, after the power is cut off, the wheels will revolve for four hours fast enough to maintain the equilibrium of the car, and two or three days will pass before they come to a standstill. These gyroscopes work with an intelligence that an observer has described as uncanny. Not only do they keep the car upright when it is standing still or running in a straight line, but like a man on a bicycle, they incline it inwards when rounding a sharp curve, bringing it to the perpendicular again as soon as it travels once more on a straight length of track. The gyroscopes are motor-driven, and run at a speed of from 7,000 to 8,000 revolutions. This mechanism occupies little space, and will represent only about 5 percent of the total weight of the vehicle.

The present model was constructed specially to show the value of the invention for military use. The monorail can be laid right along the ground without excavations or embankments, without bridges or tunnels. The constructor of a gyroscopic line could keep up with a marching army, bringing all their material by gyro-cars as they went along. When they come to a chasm all they need to do is to stretch a cable across, and with this a gyro-car is quite content and safe. As Robert Barr says in a recent London magazine, the terror of bridge burning in war is thus eliminated, for the car is a mechanical Blondin, which scorns the Niagara Gorge.

It is said that modern railways lose 85 horse-power out of every 100 used, because of friction and other drawbacks. The gyro-car will save fifty percent of this loss, and so perfectly does the car adjust itself to all conditions and curves of tracks, that it is expected a speed of 140 miles an hour may be obtained. Indeed, with the growing efficiency of electricity as the motive power, no man can predict with any certainty at what point the limit of speed will be reached.

Mr. Brennan is at present engaged upon the construction of a full-sized

vehicle, which will be driven by a petrol engine of 100 horse-power direct, coupled to a motor. The gyroscopes will be 2 feet 9 inches in diameter, and will have a speed of from 2000 to 3000 revolutions per minute. The road wheels will be power-driven, and change gears provided to facilitate hill climbing. It will also be possible to free-wheel down hill. Brakes capable of being operated by pneumatic or manual power will be fitted to all the wheels. The inventor considers that one of the most valuable applications of his monorail will consist in its adaption to vehicles of ordinary dimensions, which will serve as feeder lines to existing railways, and pioneer lines in new countries. By this means, he states, it will be possible to construct lines at a minimum cost, and give settlers a means of getting their produce to market with great speed and economy.

As is natural, Mr. Brennan is very sanguine as to the future of his railway. By its means, he says, vehicles of colossal dimensions, more like moving hotels or ships on shore than the usual form of railway carriage, will travel at velocities of probably from two to three times that attainable at present. At the same time there will be a complete absence of lateral oscillation in the carriages. and a great increase in the smoothness with which they will run. Every facility can be given for the enjoyment of life while traveling, as the carriage may be fitted up with all the comfort of a first-class hotel, and separate rooms provided for every purpose, such as smoking, dining, reading, writing, etc., even promenade and music rooms can be provided to relieve the tedium of railway traveling.

Panama Hats.

As widely as Panama hats are worn, very few people know where they come from or how they are made. The average man will tell you that his information is limited to the fact that they are from Panama. This is a mistake. They are not made on the Isthmus, but come from the neighboring republic of Ecuador, where they are called "jipijapa" hats—a name with a true comic opera flavor The palm which yields the straw grows wild in the low, damp forests of this tropical region. When the leaves expand sufficiently, the youngest ones are gathered, and the stalk cut about 5 inches below the leaf. The outer plaits are torn off the sides, as they are too tough to form good straw. The remainder is torn, plait by plait, these being generally half an inch wide and corresponding to the veins of the leaf. They are further split into shreds of varying sizes by means of a piece of wood into which needles are affixed. The fibers are submerged in boiling water, and dried in the shade and subsequently in the sun. The straw is then classified for market use. All the weaving is done by hand. The finest hats take months to weave, and command the high price of $100 or $125.

AN AUTOMOBILE ROAD TRAIN.

By Frank C. Perkins.

TRAINS propelled by motors and running on ordinary roads are coming into extensive use in Europe. The roads in the old country are so uniformly good that this method of transit has few drawbacks. In Holland, France and Germany, in Austria-Hungary, Spain and Portugal, even in remoter sections such as Turkey, Servia and Bulgaria, these automobile trains have been placed in service.

An automobile is used in place of the ordinary locomotive, a light tractor being provided for the purpose of carrying the motor which generates the necessary energy for propulsion and for steering purposes.



This type is used by the French army for carrying provisions, ammunition and other material, a train being utilized to advantage on the strategical roads at the last manœuvers of the de l'Est, Chalons. The military governor of Cochin, China, with his staff, put the train through severe tests at the Billancourt Works, and reported to the War Minister that such a train was indispensible to the Colony, not only for military purposes but for the administration and development of the whole country.



It is stated that these trains are to be used on the Indian frontier for Commissariat and Transport purposes, as well as in Burmah and Ceylon to act as feeders in the rice, timber, and tea districts, and in times of famine.

As compared with rail vehicles, the motor-train possesses many advantages including low first cost for establishing the service, as well as flexibility and safety on hilly roads. It is maintained that there is no skidding and almost no side-slip, with no undue wear and tear of roads. There is no fixed limit to the weight or length of the train, the single-handed control from the locomotive greatly reducing the cost of operation. There is said to be no difficulty in backing out of awkward positions, and it is claimed that the train is able to travel over roads that are unsuitable for exceptionally heavy traffic such as traction engines, on account of the weakness of the bridges or the inadequacy of the road foundations. There is a great advantage in the lightness possessed by this train, and the steering arrangement (comprising a series of tillers connecting the front of each car with the back of the preceding one) is such as to cause every vehicle to follow accurately in the track of the locomotor, as though the train were run on rails.

It is most interesting to watch the action of this mechanism, the train being able to zigzag, snake like, around double corners, or, having curled itself up in a garage, to back up out over its own track. It is stated that the locomotive need not even be in front.

The train shown in the illustration, as operating without rails with a high power automobile in place of a locomotive, is in Hungary. It has a total seating capacity of 112 passengers. There is one open air carriage, having 32 seats, a closed omnibus with 24 seats, and a freight car. The locomotor is of the gasolene type, the engine having a capacity of 75 horse-power.

The Renard road and rail transport system is used, the engine being of the four-cylinder type and the cars each having 6 wheels with a system of compensated suspension which enables any one of the wheels to surmount an obstacle without imposing more strain upon the spring immediately above it than is indirectly applied to either of the other two springs on the same side of the frame. The two middle wheels on each omnibus are used as drivers, while those at the end do the steering. The power developed by the engine is transmitted to each of the coaches composing the train, so that the locomotive itself is not called upon to do any extensive hauling. As the shaft extends right through the train of vehicles, each car is practically driven independently, although from a common power supply.

The engine is coupled up through the usual friction clutch to a gear box of the sliding spur wheel type, by means of which the shafting driving the entire train can be changed at will. There is another gear box having sliding spar wheels, giving two speeds for supplying power for driving the locomotive itself, the lay shaft in this case being beneath the engine driven shaft, the necessary power for propulsion being taken through it and the differential counter shaft to the chains which drive the road wheel.

It will be noted that railway locomotives have their wheels coupled together, in order that more of the dead weight may be effective in providing adhesion for the driving wheel. In the same manner Renard sought to make the road train a mechanical possibility by employing the "multiple-unit system," at the same time concentrating all the driving power for the sake of economy in a single engine. There is no direct drive, for the engine-driven shaft passes straight through the gear box, terminating at the rear of the chassis in a universal joint, and it is coupled to a similarly jointed propeller shaft passing through the whole length of the train. In order that it may accommodate itself to the motion between the vehicles, the shaft is made telescopic. There is a gear box on each of the cars forming the train, similar to the smaller of those employed on the locomotive.

Lead Wool.

Shredded lead, or lead wool, is now extensively used to joint lengths of pipes in place of the cumbersome and wasteful method of pouring molten lead inside the joint and calking after it has cooled. Lead wool is furnished in strands, which are forced into the joint after the yarn has been put into place. Each layer is firmly calked as it is put in, the result being a tight, solid joint. Joints can be made under water or in the rain, and the pipes may lie in any position. Such work is impossible with the molten lead method, for lead cannot be poured uphill or in the presence of moisture.

THE RISE OF THE STEAMSHIP.

JUST a century has passed since the first successful boat propelled by steam puffed its way up the Hudson, amid the shouts of the astonished onlookers, at the rate of five miles an hour. As we have been building steamships a hundred years, it may be interesting to review what has been accomplished and what the immediate future holds for us.

The hull of the Clermont, Fulton's boat, was a hundred and forty feet long by sixteen wide, and seven deep.

The boiler was of copper plates, which leaked every few miles, so that frequent applications of melted lead was necessary. The fire-box was of masonry. The boat had about 20 horse-power, and could carry a hundred tons of freight. She was, of course, a side wheeler. The crowd that watched her leave the wharf on her trial trip hooted and jeered; and when it became apparent that the boat would work in spite of everything, the sloop skippers deliberately collided with her, in the determination to destroy her wheels and run her off the river. The first improvement, therefore, was a frame to enclose and protect the wheels. But the spread of the steamship over the world was slow. It was four years from the Clermont's day to the building of the first Mississippi steamer, and 12 years before the first steamer plied on the Great Lakes. Horse-driven ferry boats moved between New York and Brooklyn as late as 1833. In spite of a few efforts, which proved commercial failures, to establish a line of packets between the United States and England, it was not until 1840 that the first regular transatlantic service was begun. The illustration shows, in a graphic manner, the evolution of the liner from paddle to turbine. The insignificant little steamer at the head of the drawing is the Brittania, which made her initial voyage in July, 1840. Her tonnage was only 1,139. It is a long step from this to the modern greyhound of 30,000 tons, which swoops across the seas at 25 knots an hour.

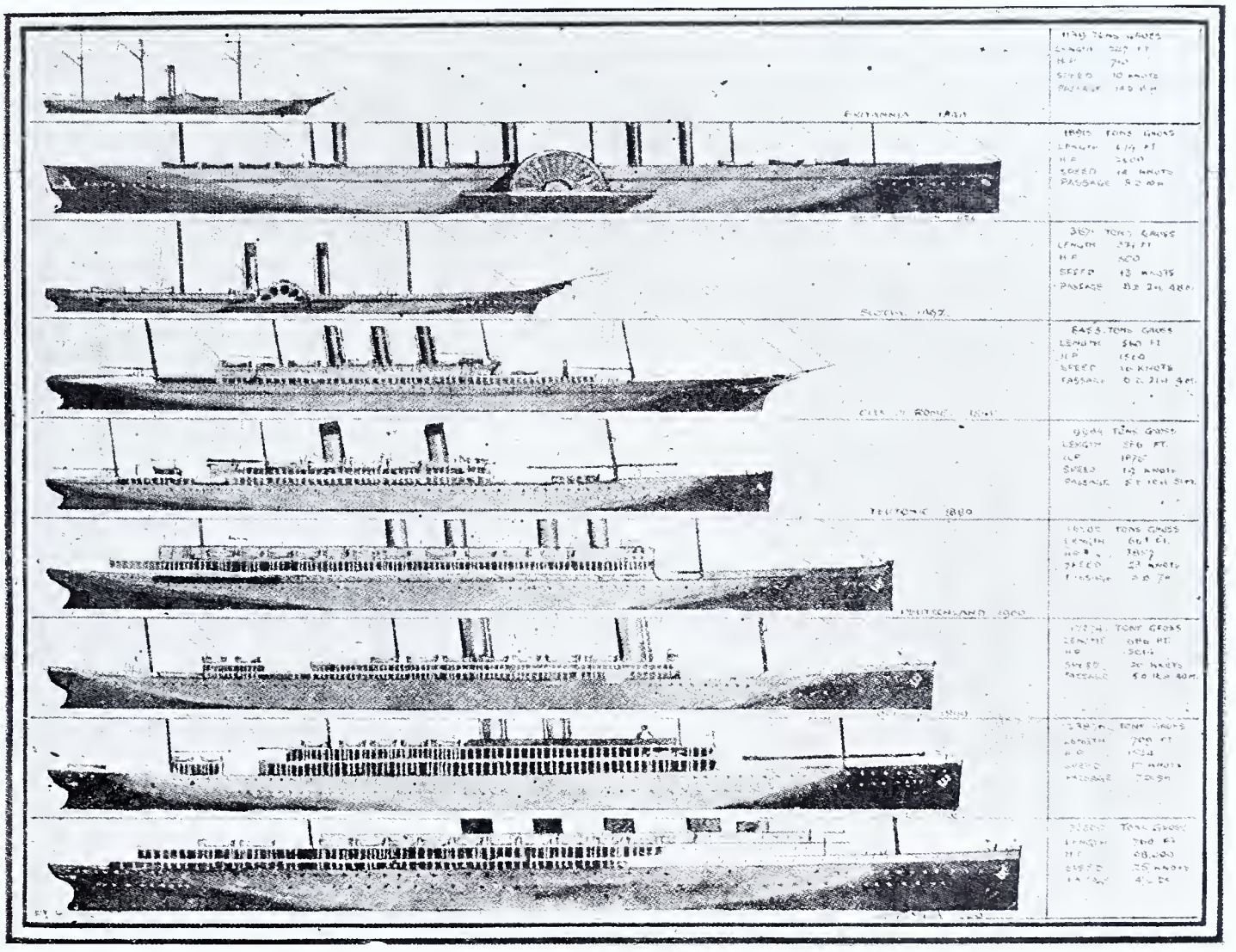
The Great Eastern—the largest steamer ever constructed up to the present year—was simply the result of an intelligent appreciation of the requirements of modern trading, 50 years ahead of her times. Her fault lay in the low power of her engines, which were quite inadequate to the task of driving her immense hull through the water at anything like an economical speed and consumption. She was abandoned and broken up.

Up to 1862, relatively few changes had been made in boat construction over the original type. In river boats a wheel at the stern had been substituted for the side wheels, but in both the ocean and the river vessels a simple one-cylinder engine drove the machinery by turning paddle wheels. But a new method of propelling ships had been developed. The day of the screw was at hand.

In this connection, it is worthy of note that screws were used by the celebrated Stevens family of engineers before Fulton got the Clermont afloat; but the device was dropped when the Clermont succeeded. In 1836 Ericsson, disgusted at his failure to win approval for his ideas in England, brought them to America, and a number of men-of-war of our navy were fitted with screws, and were of great service during the Civil War. But merchant engineers were conservative. The Scotia, (shown in the drawing) had a cylinder that was 8⅓ feet in diameter by 12 feet in stroke. To keep up her speed of 13 knots an hour, she burned no less than 164 tons of coal a day. Finally it was shown that a screw steamer could make equal speed and carry more freight with a consumption of 82 tons a day, and that comparison killed the paddle wheel for deep sea traffic. Still, the engine remained practically the same—one great cylinder supplied with steam in the old fashion; and because the piston speed of the huge engine was slow, it was in some cases made to drive the propeller shaft by means of cog-wheels—with wooden cogs, at that. But again a new device was working its way to adoption. This departure was the compound engine. Steam, it should be remembered, does its work by expanding in a cylinder and pushing a cylinder to and fro. With increasing volumes of steam, the builders a generation ago merely increased the size of cylinders, pistons, etc., until the ships were practically filled with machinery. But it was seen that the power in the expanding steam could be fully utilized by taking the steam from the boiler first to a cylinder of small dimensions, partly expanding it there, and then conducting it to a larger cylinder to complete its expansion. These small cylinders weighed less and occupied less space than the old simple engine. So the compound engine found its place, and the engineers quickly proceeded to three expansion, and then to four. The City of Rome and the Teutonic, shown in the cut, were examples of this type of vessel, and both were record breakers in their day. The latter was fitted with twin screws, and the Deutschland, the Oceanic and the Baltic are the latest development in this line. But competition demanded still swifter ships, and a still newer departure in machinery was signaled by the adoption of the turbine.

From the days of Watt, steam engines consisted of a cylinder within which a piston was driven to and fro by admitting steam first on one side and then on the other. A British inventor, Parsons, abandoned the piston, and by placing a windmill within the cylinder, he drove the steam against the vanes and made the most important departure in the history of harnessed steam. Not only can a turbine drive a ship faster than a reciprocating engine; the new machine occupies far less space, and is more economical. The Lusitania, the last boat shown in the illustration, is of this type, and it is expected that it will cross the Atlantic in four days.

But the turbine does not mark the limit of development in the use of steam. We have discovered a new way of utilizing the energy found in fuel—a way that is far more economical than burning it under a boiler full of water. By extracting the gas from coal and using the gas to drive a piston, the amount of latent energy saved is more than twice that utilized when the coal is employed to create steam. Indeed, the builders of gas engines claim that they get 3 or 4 times as much work out of coal as a steam engine does. Gas engines up to 2,000 horse-power are on the market, and have already been successfully applied to ships. Lewis Nixon, the famous ship builder, predicts that gas is the coming motor in the transatlantic service. To turn from the use of the whirling turbine to the reciprocating engine, even though it be driven by gas, would seem a step backward; but the evolution of a gas turbine is in hand, and it is not difficult to believe that it will shortly be perfected and installed.



FROM PADDLE TO TURBINE: A SIXTY-SIX YEARS' RECORD.

Gold in Sea Water.

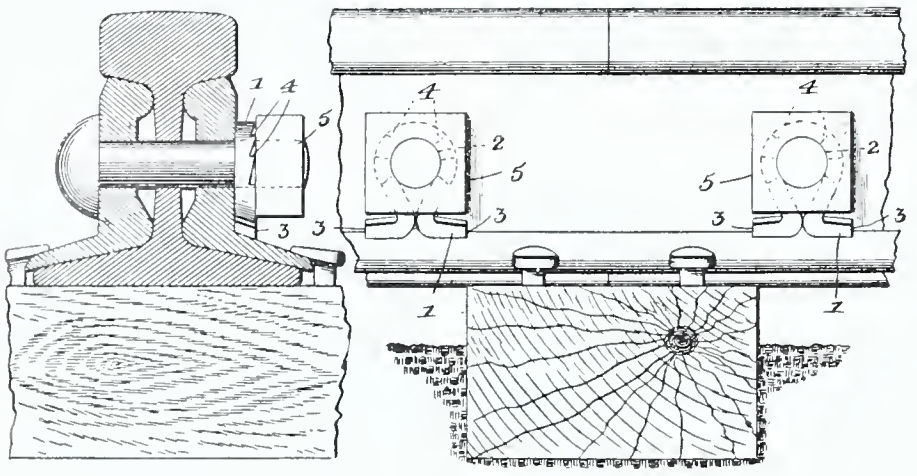
One of the richest of known sources of gold, and apparently one of the most accessible, is beyond the reach of man. Incalculable quantities of the precious metal—millions of tons—are held in solution by the waters of the ocean. It is true that it takes on an average a ton of water to yield a grain of gold. In other words, you get about $5 worth for each 500 tons of water handled. But some day a way of extracting it on a paying basis will be discovered, and the process will then become one of the commonplaces of industrialism. Many clever brains are at work on the subject.

CLEVER NEW PATENTS.

NUT LOCK.—FOLDING TABLE.—POTATO DIGGER.—AURIPHONE OR EAR TRUMPET.

Nut Lock.

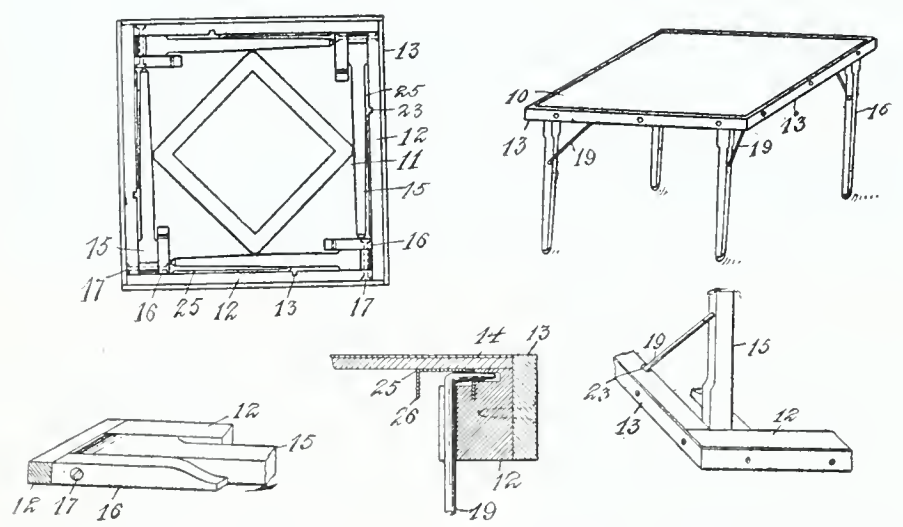
The class of nut locks in general, and especially those used on railroad fish plates, has been materially improved by an invention of Mr. Sivert Benson, of Spring Valley, Minn., who has assigned two-thirds interest therein to Messrs. Wm. B. Hutton and Ralph J. Parker, of the same place. As shown by the accompanying views, the invention is a very simple and yet positive one. A spring member 1 is employed comprising a substantially circular body portion 2 which terminates in the end portions or arms 3-3, arranged to extend tangentially with relation to the body portion, and engage with the flange of the fish plate. The spring member 1 is curved along its longitudinal axis, and is provided on its face with a plurality of spurs 4 which are adapted to engage the nut 5 when the same is secured against the spring



member 1. This nut lock can be applied to any bolt and nut without altering their construction in any respect. Furthermore, with this form of spring member, there is no danger of the spring member working into the holes of a fish plate, and consequently no washers have to be used in connection with the nut lock.

Folding Table.

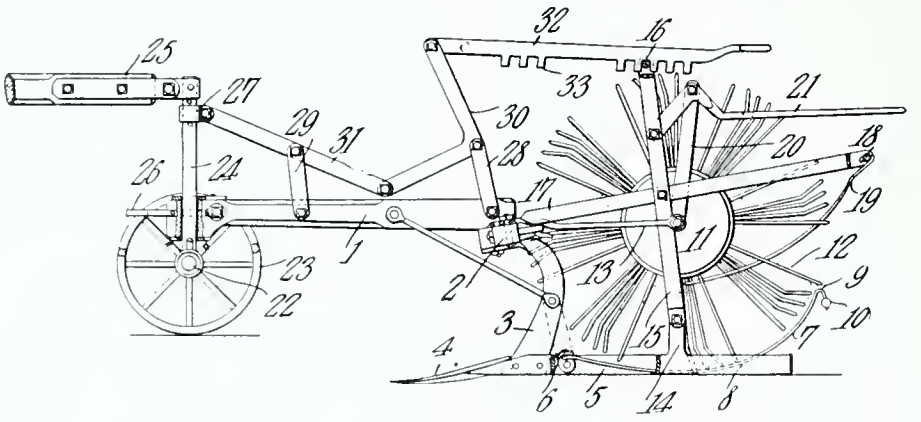
Messrs. William C. Van Cise and Frederick J. Van Cise, of Mayville, New York, recently secured a patent on a novel folding table of comparatively simple construction. The object of the invention is to provide a light portable folding table which shall be as rigid as possible when set up, yet which may be quickly and easily knocked down or folded, and when so folded the legs are locked in the folded position. The top is held from warping by a diamond or circularly shaped frame secured to its under side. Marginal rails 12 are also provided. To these marginal rails the legs 15 are pivoted by screw bolts



17, which permit wear and shrinkage to be taken up. The legs are foldable between the central re-enforcing frame and the marginal frame. When in operative position, they are held by braces 19. These braces are pivoted to the legs 15, and have offset upper ends arranged to engage in sockets formed in the marginal frame. To direct their movement, channel pieces 25 are employed and the frame bars 12 are rabbetted, thus forming guideways to permit the sliding movements of the angular ends.

Potato Digger.

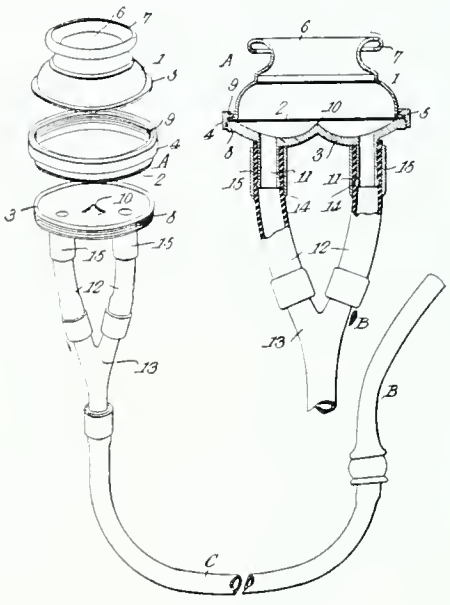
A digger for potatoes or other roots constitutes the subject-matter of a patent recently granted to Mr. Tollef Herberg, a well-known inventor of Hendrum, Minn. This digger will remove the potatoes from below the surface of the soil and deposit the same upon the surface without injuring them; and furthermore it can be readily adjusted to operate at any desired depth in the soil. It consists of a a suitable beam 1 to the rear end of which are attached standards 3 that carry a digging blade 4. Side heels 5 are fastened to the standards at the edges of the blade, and sifting bars 7 are attached at their forward ends to the blade and extend rearwardly between the heels. A revolving brush or separator is located above the sifting bars, and is so arranged that it will lift the potatoes above the loose earth and deposit them upon the surface of the soil. A suitable frame extends rearwardly from the beam, and fender bars are attached to the frame and are adapted to keep the



revolving member free of trash and the like. The forward end of the beam is vertically adjustable on a standard 24, and a lever 32 having bell crank and link connections with the beam and standard constitute means for effecting the raising and lowering of the beam. The tongue or draft member 25 is attached to the upper end of the standard.

Auriphone or Ear Trumpet.

An improved Auriphone has been made by Mr. Daniel O. Fosgate, of Chicago, Ills. The improvement relates more particularly to ear trumpets of that type in which a diaphragm is employed in the mouthpiece to augment the wave sounds produced by a person speaking into the same. One of the principal aims of Mr. Fosgate is to improve and simplify the construction, and to provide a mouth piece which possesses superior intensifying qualities so that the slightest sounds become audible, this being due to the particular form of chamber behind the diaphragm whereby the wave sounds are so affected that they are greatly intensified on their way through the speaking tube. To this end, a disk 3 is employed having one face concaved to form a projecting rim, and a conical central portion 10. A dome-shaped shield 1 is secured to the disk by a clamping ring 5, and has a concavity that faces the concavity of the disk. A diaphragm 2 is interposed between the shield and disk and separates the concavities thereof. Projecting from the rear side of the disk are a pair of nipples 15 to which the branches 12 of a sound-conducting tube C are connected. In operation, the sound waves produced by the speaker's voice cause the diaphragm in the mouthpiece to vibrate so that the air on the back side of the diaphragm is also set into vibration. These wave sounds are divided by the cone 10 and intensified thereby, and by the particular shape of the chamber formed between the diaphragm and disk 3. These intensified sound waves are then directed through the branches of the sound-conducting tube, and then come together in the latter, whereupon they are transmitted to the ear of the hearer. The sensitiveness of the instrument is such that it can be used successfully as a stethoscope for testing the action of the heart. When used in this manner, the mouthpiece 1 is placed against the body of the person being examined, while the ear piece B is, of course, held to the ears of the physician. It has been found in practice that the instrument is so sensitive that the heart's action can be heard distinctly through heavy clothing and even while a person is wearing a heavy winter overcoat.



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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

BUSER et al. v. NOVELTY TUFTING MACHINE CO.

(Circuit Court of Appeals, Sixth Circuit. January 8, 1907. 151 F. R. p. 478.)

1. PATENTS — ANTICIPATION — ABANDONED EXPERIMENT.

Where the idea of a machine has been conceived, and the conception carried into effect by the construction of the machine, which is used, or is capable of being used, for the purpose for which it was designed, it is no longer an experiment, but an invention; and the subsequent abandonment of the use of the machine does not render it an abandoned experiment, nor lessen its effect as an anticipation which will invalidate a subsequent patent to another for substantially the same machine.

2. SAME—FORGOTTEN INVENTION.

An invention which has been perfected by the construction of a machine, which was used in practical work for a number of years by the inventor and is still in his possession, and of which he had photographs taken, which he still preserves, does not lose its effect as an anticipation of a subsequent patent to another for substantially the same machine as one which has been finally abandoned and forgotten, although the inventor failed to realize the full value of the invention and after a time discontinued the use of the machine.

3. SAME—TUFTING MACHINES.

The Pitner patent, No. 577,809, and the Freschl reissued patent, No. 11,778 (original No. 620,070), for tufted machines for making tufted work in upholstering, held void, for anticipation and prior use, on evidence which established beyond a reasonable doubt that defendants made and used in their business, many years prior to the patents, a machine embodying all the essential features of those of the patents.

W. & J. SLOANE v. DOBSON et al.

(Circuit Court of Appeals, Second Circuit. January 7, 1907. 151 F. R. p. 497.)

PATENTS — INFRINGEMENT—FASTENER FOR STAIR CARPETS.

The Adams patent, No. 587,633, for a fastener for stair carpets, claim 1, is void for anticipation. Claim 2 held not infringed.

ELEVATOR SUPPLY & REPAIR CO. v. PEDERSEN.

(Circuit Court, S. D. New York. February 28, 1907. 151 F. R. p. 497.)

PATENTS-INFRINGEMENT-ELECTRIC SIGNALING APPARATUS.

The Armstrong patent, No. 499,411, the Opdyke patent No. 572,561, and the Smalley & Reiners patent No. 634,220, all relating to an electric signaling apparatus for elevators, held valid and infringed.

AMERICAN WRITING MACH. CO. v. WAGNER TYPEWRITER CO.

(Circuit Court of Appeals, Second Circuit. January 8, 1907. 151 F. R. p. 576.)

1. PATENTS— ANTICIPATION — TABULATING ATTACHMENT FOR TYPEWRITING MACHINE.

The Schulte patent, No. 450,592, for an improvement in typewriting machines, consisting of a tabulating attachment, claim 9, is void for anticipation by an invention made by Yost for which an application for a patent was filed several years before the Schulte application, accompaned by a full-sized operative model embodying the combination of said claim, which was also shown in the drawings, it being further shown that another of such Yost machines was built at abont the same time and practically used for tabulating purposes. Also held not infringed, even conceding that it was not anticipated.

2. SAME—MODEL AS EVIDENCE OF ANTICIPATION.

While a model filed in the Patent Office will not, in itself, amount to an anticipation which will invalidate a subsequent patent to another, the word "model" as so used must be understood in its ordinary sense as meaning merely a pattern or representation, and not as meaning the actual machine or device of the invention.

WAGNER TYPEWRITER CO. v. WYCKOFF, SEAMANS & BENEDICT.

(Circuit Court of Appeals, Second Circuit. January 8, 1907. 151 F. R. p. 585.)

1. PATENTS — CONSTRUCTION OF CLAIMS— IMPROVEMENT PATENTS.

In construing improvement claims of a patent, consideration should be given to the character of the improvements introduced by the patentee and the change in the art attributable to them. When they result in converting imperfection into completeness, and in producing the first practically and commercially successful machine, however simple the change appears, the invention is entitled to liberal treatment by the courts.

2. SAME—PRIMARY IMPROVEMENTS.

Courts look with favor upon patents for primary improvements which are novel and a manifest departure from the principles of prior structures, and which constitute the final step necessary to convert failure into success.

3. SAME.

A strict construction of the claims of a patent should not be resorted to, if the result would be a limitation on the actual invention, unless it is required by the langnage of the claim.

4. SAME-INFRINGEMENT-CHANGE OF PARTS.

Infringement is not avoided by changes in a patented machine which are nonessential, as by changing the positions of parts or transferring a function from one part to another, without effecting the principle or mode of operation.

5. SAME— CONSTRUCTION OF PATENT FOR PRIMARY IMPROVEMENTS—TABULATING ATTACHMENT FOR TYPEWRITERS.

The Gathright patent, No. 436,916, for an improvement in typewriters, which consists of an automatic tabulating attachment, while not for a pioneer invention, covers a primary and valuable improvement on the tabulators of the prior art, and the first practically and commercially successful tabulating device, and its claims are entitled to a construction sufficiently liberal, and a range of equivalents sufficiently broad to protect the actual invention. As so construed, claims 4 and 5 held infringed.

6. SAME-INFRINGEMENT-SPECIFIC IMPROVEMENT CLAIMS.

A patent for a specific improvement on a prior machine is not infringed by a machine which does not contain such improvement, on the theory that an equivalent device is used.

7. SAME—INFRINGEMENT.

The Gathright patent, No. 452,268, for an improved tabulating attachment for typewriters construed, and held not infringed.

AMERICAN GRAPHOPHONE CO. v. UNIVERSAL TALKING MACH. MFG. CO.

SAME v. AMERICAN RECORD CO.

(Circuit Court of Appeals, Second Circuit. January 14, 1907. 151 F. R. p. 595.)

1. PATENTS—INVENTION—EVIDENCE.

Where an existing process or device discloses what appear to be insuperable objections to practical operation, it is persuasive evidence of invention that an improver has the foresight and courage to break away from such disclosure and conceive of some new method involving a different principle; but it is also evidence of invention if one, by taking a step forward, sees that what appeared to be barriers to progress are mere obstructions to side paths and byways, and that the road to a practical invention lies straight ahead.

2. SAME.

Where the question of invention is still left in doubt after the application of the usual negative tests to establish want of invention, such doubt may be resolved in favor of the patent by evidence of successful results where others had tried and failed, especially where such success is in both operative and commercial results.

3. SAME — PROCESS FOR MAKING SOUND RECORDS.

The Jones patent No. 688,739, for a method of producing sound records for use in talking machines of the gramophone type, which consists of cutting or engraving a record groove of uniform depth, by means of the lateral vibrations of a suitable stylus, upon a disk of waxlike material, coating the same with a conducting material, and then forming a matrix thereon by electrolysis, from which the duplicate records are made by impression, was not antipated by anything in the prior art, and discloses patentable invention. Also held infringed.

VICTOR TALKING MACH. CO. et al. v. AMERICAN GRAPHOPHONE CO.

(Circuit Court of Appeals, Second Circuit. January 14, 1907. 151 F. R. p. 601.)

1. PATENTS — CONSTRUCTION OF CLAIMS— PROCEEDINGS IN PATENT OFFICE.

Where it is shown that a patentee has acquiesced in the rejection of broad claims by the Patent Office by their cancellation and the substitution of narrower claims therefor, the limitations thus introduced into such claims must be read and interpreted in the light of the circumstances surrounding the issuance of the patent, as shown by a reference to the rejected claims and to the prior state of the art.

2. SAME.

An applicant for a patent is entitled to specify and claim in his application the subject-matter of which he believes himself to be the original inventor, and to persist in his assertions and claims until final action thereon by the Patent Office; but when his claims are rejected on references cited against them, he is called upon to exercise his election between insistance and appeal, or desistance and acquiescence, and, if he acquiesces, the public is entitled to the benefit of the limitations and admissions imposed upon him as a condition precedent to the allowance of the patent.

3. SAME—INFRINGEMENT SOUND RECORDS.

The Berliner patent No. 548,623, for duplicate sound records and method of making the same, in which the matrix is protected against the sulphur fumes from hard rubber by facing it with a metal not attacked by such fumes, is limited by the proceedings in the Patent Office to records composed of hard rubber, and is not infringed by records made from a different material and one which does not require the method of the process claims.

EDISON v. AMERICAN MUTOSCOPE & BIOGRAPH CO.

(Circuit Court of Appeals, Second Circuit. March 5, 1907. 151 F. R. p. 767.)

PATENTS—VALIDITY AND INFRINGEMENT— KINETOSCOPIC CAMERA.

The Edison reissued patent No. 12,037 (original No. 589,168), for a kinetographic camera, claims 1, 2, and 3, were not anticipated and disclose patentable invention in the means shown for imparting an intermittent movement to the tape film while passing in front of the lens, which consist of a sprocket wheel having teeth which enter holes in the edge of the film and advance it positively, evenly, and rapidly. Such claims held not infringed by a camera in which the film is moved by frictional contact alone, although such construction is within their terms if construed without reference to the words, "substantially as set forth," but infringed by one in which the film is moved by a reciprocating two-tined fork carrying studs or pins which engage holes on either edge of the film, and is the substantial equivalent of the sprocket wheel of the patent. Claim 4 of said reissue held void as too broad.

KARFIOL v. ROTHNER et al.

(Circuit Court, E. D. New York. February 9, 1907. 151 F. R. p. 777.)

PATENTS—SUIT FOR INFRINGEMENT—PRELIMINARY INJUNCTION.

It is the general rule that a preliminary injunction will not be granted to restrain the alleged infringement of patents which have not been adjudicated, and in which there has been no such public acquiescence as to establish their validity, unless special circumstances are shown which render it necessary to protect complainant's rights, and when such circumstances are shown, but it also appears that the granting of the injunction would cause irreparable injury to defendants, if they should finally succeed in the suit, the better practice is to permit them to give security to pay any damages which complainant may recover, and, on its being given, to refuse the injunction.

R. J. REYROLDS TOBACCO CO. v. ALLEN BROS. TOBACCO CO.

(Circuit Court, W. D. Virginia. March 20, 1907. 151 F. R. p. 819.)

1. TRADE-MARKS AND TRADE-NAMES—SUIT FOR UNFAIR COMPETITION—DEFENSES.

The claim that a conveyance by one manufacturing corporation to another of all its property, including its trade-marks, trade-names, brands, and labels, contains a provision in violation of the anti-trust law of the United States, is not available as a defense by another manufacturer when sued for intringement or unfair competition in respect to a trade-mark, brand, or label, where it is shown that the same has been continuously used by the grantee as its own, and a long time prior to the commencement of the [illegible] infringement or unfair imitation.

2. SAME—UNFAIR COMPETITION — SIMULATION OF DRESS.

Complainant and its predecessors in business from about 1880, made and sold a brand of plug tobacco known as "Schnapps," and in 1894 commenced placing upon the plugs tin tags of rhomboid shape, and having a dark background with the word "Schnapps" thereon in red letters slanting backward, which tag, as shown by the evidence, was novel and distinctive. During the following 12 years nearly 800,000,000 of such tags were used, and also several millions of advertisements, hangers, etc., were sent out bearing thereon pictures of such tag which came to be known throughout the Southern states as the distinctive mark of the Schnapps brand. Many of the retail customers were unable to read, but identified complainant's tobacco entirely by the tag, and size and shape of the plug. Later defendant put upon the market a cheaper grade of tobacco in plugs of the same size and shape, and with tags thereon of the same size, shape, style, and colors: the only difference being in the name which was "Traveller" instead of "Schnapps," which difference could not be distinguished at a short distance. The evidence showed that the simulation was intended to, and did in fact, deceive customers who intended to buy complainant's product. Held, that such simulation constituted unfair competition and entitled complainant to an injunction.

QUINCEY MINING CO. v. KRAUSE et al.

(Circuit Court of Appeals. Sixth Circuit. March 5, 1907. 151 F. R. p. 1012.)

1. PATENTS — ANTICIPATION — HYDRAULIC ORE SEPARATOR.

The Krause patent. No. 681,234, for an improvement in ore crushers, consisting of a hydraulic separator for removing from the mortar, through a conduit leading from its side downwardly and having an upward flow of water therein, pieces of ore separated by the stamp, but which are too large to pass through the screen, held not anticipated by a prior separator, in which the conduit opened from above the mortar at the bottom of the screen. Also, held infringed.

2. SAME—JOINT INVENTION.

When a claim covers a series of steps or a number of elements in a combination, the invention may well be joint, though some of the steps or some of the elements may have come as the thought of one.

CANDA BROS. v. MICHIGAN MALLEABLE IRON CO.

(Circuit Court of Appeals, Sixth Circuit. March 21, 1907. 151 F. R. p. 178.)

1. PATENTS—JOINT SUIT FOR INFRINGEMENT —PROFITS RECOVERABLE.

In a suit by joint owners of a patent for its infringement, profits cannot be recovered which accrued from infringements prior to the date of the joint ownership, and when the patent was the sole property of one of the complainants.

2. SAME—ACCOUNTING FOR PROFITS—DEDUCTION FOR LOSSES.

On an accounting for profits for infringement of a patent, the infringer is not entitled to deduct from the profits made during a certain period of time a loss subsequently incurred in a separate transaction. On such an accounting only losses occurring concurrently with the making of profits and directly resulting from the particular transactions on which the profits are allowed may be considered in diminution of profits.

3. SAME.

Where infringement of one claim only of a patent is adjudged, the infringer cannot be held to account for profits arising from the sale of a part of the device which was not an element of such claim, although it may have been an element of other claims.

4. SAME—SEPARATION OF PROFITS.

It is the settled rule that, where the infringed device was a portion only of defendant's machine, which embraced inventions covered by other patents, it is incumbent on the complainant to show how much of the profits made was due to such other patented parts, and how much to those of his own invention; but, before such rule is applicable, the burden rests upon the defendant to show the existence of such extraneous elements and the probability that they affected the price of the machine, and this is not done by showing that elements of the combination of complainant's patent and of the infringing machine were also elements of prior patented combinations where they were not separately patented and were therefore open to use by complainant as parts of [illegible] own combination and invention.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

John W. Connett, Waverly, Iowa. Churn.—An object of the invention is to provide a light, easy running churn, adapted to be operated by the foot, and capable of effecting a rapid production of butter.

John Y. Brown, Providence, Ky. Attachment for Bow Instruments.—An object of this invention is to provide for violins and other bow instruments a sympathetic vibratory device, tuned to give an octave, and adapted to increase the power of a violin and improve the quality and increase the duration of the tones thereof.

John J. Putney, Lawton, Oklahoma. Potato Cutter and Planter.—An object of the invention is to provide a machine designed for planting two rows of potatoes, and adapted to cut a potato into pieces and drop one or two portions or seeds in each hill. Another object of the invention is to enable the actuating mechanism for the cutting and planting means to be changed for controlling the speed of the same and the distance between the hills.

Samuel A. Sizemore, Leadwood, Mo. Swivel for Rock Drills.—The aim of the inventor has been to provide improvements in water heads or swivels for diamond drills that will reduce the friction between the relatively rotatable parts without effecting the necessary tightness of the joint between them. The inventor employs a system of rollers and balls that eliminates the friction due to longitudinal and lateral strain.

Abner F. Callison, Gage, Okla. Loading and Unloading Mechanism.—This inventor provides novel and simple means for transferring loads bodily from a vehicle onto a carrier or car, which takes the load to the place of deposit and there dumps it, effecting a great saving in time and labor that is now ordinarily spent in unloading a vehicle.

Charles N. Kalstrom, Manson, N. C. Combined Sash and Blind Lock.—An object of this invention is to provide a combined sash and blind lock adapted to be readily applied to a window, and capable of securely fastening both the shutters and the lower sash and of effectually preventing the same from being surreptitiously unfastened without making sufficient noise to alarm the occupants of a house.

Pehr Christiansson, Carlos, Minn. Hill Marker.—An object of the invention is to provide a hill marker, designed for use on machines to be driven continuously back and forth across the land, and adapted to mark at the end of each row the point where the first hill of the next row is to be planted.

Pehr Christiansson, Carlos, Minn. Frame for Agricultural Machines.—An object of the present invention is to provide a machine frame capable of lateral adjustment to arrange it to correspond to the distance between the hills or rows, and adapted to be raised or lowered to arrange the devices carried by it in the desired position with relation to the soil.

Pehr Christiansson, Carlos, Minn. Land Marker.—One of the objects of this invention is to provide a land marker adapted to be readily applied to a corn planter and adjustable for marking rows of the desired width, and adapted to be arranged at either side of the machine. Another object of the invention is to enable the land marker to hang loose and follow the configuration of the ground, whereby the marker is capable of effective work on either level or rough ground.

Pehr Christiansson, Carlos, Minn. Corn Planter.—An object of the invention is to provide a planter, adapted to plant corn in hills and rows the desired distance apart, and capable of adjustment to vary the distance between the hills and rows. Another object of the invention is to enable the planter to be driven continuously back and forth across the land without necessitating the driver leaving his seat, and to mark the land at the end of each row for indicating the point where the first hill of the next row is to be planted.

John Schuster, Algoma, Wis. Milk Pail Support.—An object of this invention is to provide a milk pail support, designed to rest upon the legs of the milker for suspending a milk pail between the same, and adapted to be quickly applied to, and removed from, a milk pail, and capable of securely gripping the same and of enabling the legs of the milker to be arranged in a variety of positions to support the milk pail at the desired elevation.

Colin Livingston, Muskegon, Mich. Sprocket Chain.—An object of the invention is to provide a sprocket chain having links capable of being readily connected and disconnected, and adapted to present flat faces to wooden bearing surfaces to reduce the wear to a minimum. Another object of the invention is to enable the central and side links of a chain to be drawn tightly together to prevent them from chafing and abraiding the sprocket wheels.

Charles H. Driver, Tarpon Springs, Fla., inventor; Wm. W. K. Decker, John K. Chaney and Hayes Bigelow, Brattleboro, Vt., assignees. Axle Lubricator.—An object of this invention is to provide an axle lubricator, adapted to enable the wheels of a vehicle to be readily lubricated without removing them from the axles, and capable of feeding a sufficient quantity of lubricant from the exterior of the axles to the interior thereof, and of preventing the lubricant from wasting by too free a flow.

Charles H. Driver, Tarpon Springs, Fla., inventor: Wm. W. K. Decker, John K. Chaney and Hayes Bigelow, Brattleboro, Vt., assignees. Vehicle Axle.—An object of the present invention is to provide a vehicle axle equipped with means for enabling the wear and lost motion to be readily taken up, and adapted to permit the parts subjected to wear to be readily renewed without discarding the entire axle.

Rufus B. Humphrey and Hanson M. Fillyard, Lumberton, N. C. Spring Bed Bottom.—An object of this invention is to improve the manner of mounting the springs on the supporting frame of a bed bottom, and to provide means for connecting the springs to maintain the same in an upright position without affecting the resiliency of the bed bottom.

Robert C. Smith, Innisfail, N. W. Territory, Canada, inventor; Arthur A. Carpenter, George Clizbe and Andrew Begg, assignees, Innisfail, N. W. Terr., Canada. Washing Machine.—An object of the present invention is to provide a washing machine adapted to subject the clothes and other fabrics to the action of hot currents of water, suds and steam, whereby such clothes and fabrics will be thoroughly cleaned without rubbing or otherwise wearing, tearing or injuring the same. Another object of the invention is to afford ready access to all portions of the washing machine to enable the same to be thoroughly cleaned after the operation of washing has been completed.

Melvin D. Hatch, Lincoln, Nebr. Corn Harvester.—An object of this invention is provide a corn harvesting machine of light draft, adapted to be pulled by two or three horses, and capable of picking or snapping the ears from the stalks, and of delivering the former to a wagon and of discharging the stalks from it. Another object of the invention is to provide means for removing all the corn from the smallest nubbin to the largest ear from the stalks, whether the latter be erected or lying upon the ground, without breaking the ears or shelling the corn.

Armand L. Schupbach, Waterbury, Conn. Fish Trap.—An object of this invention is to provide a trap designed particularly for use in fishing for eels and cat-fish, and capable also of being employed for trapping various animals. Another object of the invention is to provide an exceedingly sensitive trap adapted to be hung on a line and capable of impaling eels and other fish and of effectually preventing the same from escaping, and at the same time permitting them to be readily removed from the trap without handling the fish.

Harry C. Stickel, Star Junction, Pa. Draft Rigging for Freight Cars.—An object of the present invention is to provide a pair of light, strong and durable metallic draft beams or timbers, which will not only operate to increase the life of the draft rigging, but which will also serve to brace and support the center sill and the body bolster to prevent the same from being broken by the jars and blows incident to the operation of coupling cars. Another object of the invention is to dispense with the tie rods usually employed for connecting the draft beams at one end of a car with those at the other end of the same.

August A. Yackee, Roberts, Ill. Harrow Attachment for Cultivators.—An object of this invention is to provide a harrow attachment, designed for cultivators, planters and other farm implements, and adapted to level and loosen the ground, break up clods, tear up weeds and rake the same to the surface of the ground and to uncover any corn that may be covered while plowing. Another object of the invention is to provide a harrow attachment of this character, adapted to run on the corn the first time the same is cultivated, and capable of adjustment to run close to the sides of the rows when the corn is too high for the harrow attachment to run over it. This invention also has for its object to enable the harrow attachment to be adjusted simultaneously with the beams of the cultivator, and to also be swung upwardly independently of the beams should the harrow attachment become clogged.

August A. Yackee, Roberts, Ill. Car Loaders for Grain Cars, etc.—An object of the present invention is to provide a car loader, adapted to be applied to the discharge chute or conduit of an elevator, and capable of being readily run into, and out of the car, and adapted also to discharge the grain or material in any desired direction within a car, whereby the latter may be quickly and unformly loaded. Another object of the invention is to provide a device adapted when discharging the grain to keep the same in motion, so that less power will be required to effect a discharge of grain, and a more rapid discharge of the same will be secured.

William A Palmer, Covington, Ky. Automatic Car Coupling.—An object of this invention is to provide an automatic car coupling of the Janney type, wherein the knuckle is both open and held open by the locking device, and to provide means for enabling the car coupling to be readily set for automatic uncoupling to obviate the inconvenience and danger of holding the locking block by hand in an elevated position until the cars actually separate.

William A. Palmer, Covington, Ky. Automatic Car Coupling.—An object of the present invention is to provide an automatic car coupling, capable of being conveniently released from such position when it is desired to relock the knuckle, thereby obviating the necessity of an engineer pulling his train out and running back to couple the cars. Another object of the invention is to provide means for positively opening the knuckle preparatory to automatic coupling, and to enable the knuckle to be held in its open position with sufficient strength to prevent it from being closed or partially closed by jarring or jolting.

Perry S. Dumbolton, Burke, Idaho. Union Check Valve.—One of the objects of this invention is to enable the valve seat to be changed without the expense of a complete new valve. Another object of the invention is to provide a union valve adapted to dispense with the usual packing, and capable of enabling the parts to be assembled without grinding to seat the same. The invention also has for its object to permit a direct flow through it the full diameter of the pipe to which the union is connected, and to enable the valve seat to be removed for grinding or changing in less time than has heretofore been necessary to effect its removal.

Wilson W. Miller, of Newton, Kans., is the patentee of three important inventions.—The first one relates to animal-power operated drums for hoisting purposes, and his object has been to provide means whereby a draft animal will be able to lift a comparatively great load and wherein there is no necessity for backing such animal in unwinding the hoisting cable after a load has been raised and the apparatus is being lowered for another. The invention consists of a rotatable driven member, a rotatable driving member, one of said members having inclined shoes, the other having a corresponding inclined annular friction surface disposed concentrically to the axis of rotation of the members and against which the shoes frictionally engage. Means are provided for effecting a relative movement of the members to cause the engagement of the shoes and inclined surface and form a friction connection between the members, and other means are employed for effecting the separation of said members.

The second patent relates to improvements in the type of rake wherein a forwardly projecting fork is employed on which the hay or other material is collected and is ordinarily transported to a stacker. The new rake comprises a fork, with an ejector operating thereover, a winding drum, a cable connection between the drum and ejector, and means for operating the drum.

The third patent covers an improvement in means for stacking hay, fodder and the like. The invention comprises a supporting frame including a mast, a post mounted alongside the mast, a transverely disposed pintle arranged on the upper portion of the post, a hanger bar hinged at one end to the pintle, means connected to the mast and hanger bar for raising and lowering the latter, arms pivoted on the pintle on opposite sides of the hanger bar, a bail connected to the outer portions of the hanger bar, and outer portions of the arm, and a fork pivotally mounted on the other portion of the arm.

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FOR SALE—Patent No. 862,803, and Patent No. 884,792 covering the Burke Railway Automatic Switch for street cars. Complete rights thirty-five thousand dollars. Address, Thomas J. Burke, 360 Chartres St., New Orleans, La. aug

FOR SALE—Drafting Apparatus, dated Jan. 22, 1907. Outright or on royalty. Do you want to market a good invention pertaining to drafting profession. Something worth while. Address, Thomas F. Williams, New Bethlehem, Pa. aug

FOR SALE — For cash at reasonable rates Patent No. 877,956, dated February 4, 1908. Water elevator using pneumatic pressure. Used in wells, reservoirs or other sources of water supply. Address, M. R. Shrouds, North Powder, Oregon. aug

FOR SALE or let— Patented July 1907. Trunk binder device with lever purchase. The only one ever devised. A child can bind a trunk quick and easy, and lock. Address, H. J. Patterson, St. Johns, Michigan. aug

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FOR SALE—U. S. Patent No. 876,758, issued January 14, 1908. We have a working model, making a double engine, of a simple engine, with same amount of steam. Henry C. Wolf & Leo S. Wolf, R. D. Route No. 4, Catawissa, Pa. jy

FOR SALE—Canadian Patent on fly killer. The best of its kind. Can be manufactured very cheaply. Address, W. R. Craun, Butler, Ind. jun

FOR SALE—Outright U. S. Patent No. 878,443. Grain Chute for breaking into cars. Every dealer in grain cars can save time and money with it; fully tested. Reference given. Address, A. G. Young, 69 State St. New London, Conn. aug

FOR SALE—Patent No. 866,678, dated Sept. 24, 1907. Work holding means. Must sell at once on account of sickness. Will sell to highest bidder. Address, Olaf Pearson, 318 North Sarah Street, Escanaba, Mich. aug

FOR SALE—Envelope that cannot be opened without detection. Can be manufactured at exceedingly small cost. Wish to sell outright $10,000 cash. Very simple yet most effective on the market. Additional cost of manufacturing will not exceed 1-10 of a cent each. Ellsworth Cowen, Bond Avenue, Barnesville, Ohio. aug

FOR SALE or royalty—Application Serial No. 395,247, allowed March 5, 1908. Picture Hanger. Permits frame to hang at any distance from floor, at any slant desired; is adjustable, and safe on light and heavy frames. Address, Wm. Newgent, West Baden, Ind. aug

FOR SALE—Patent No. 881,769, dated March 10, 1908. Sympathetic vibratory attachment for violins, or similar bowed instruments. Increases the duration and improves the quality of tones. Has been fully demonstrated. Address, John Y. Brown, Providence, Ky. jy

FOR SALE—U. S. Patent No. 812,229, issued February 13, 1906. A burglar proof window sash lock. Prevents burglars from entering whether the window be open or closed. Can be manufactured for 12½ cents each. Will sell cheap for cash. For particulars address, James Power, No. 9 Spruce St., Methuen, Mass. jy

FOR SALE—Patent No. 878,228, dated Feb. 4, 1908. Cabinet. Used in grocery stores. Dust proof. Opens and closes without using the hands. Operates by a treadle. Fine for lard, butter, and for the kitchen to keep bread, flour, and meal. Full information given on application. Address, S. D. Newman, Jellico, Tenn. jy

FOR SALE—Patent Nos. 683,940 and 730,457, improvements in fishing reel brakes or drags; and patent No. 730,458, improvement in camera support. No reasonable offer refused. Will sell either patent separately or all to one purchaser. These inventions have sustained the severest test, and have been found to possess great value. Address, Dr. Henry W. Howe, Alcaiceria 223, City of Mexico, Mexico. y

FOR SALE — New Musical Instrument, low priced, yet highly perfect, having large compass and volume of sound. Excellent to accompany singers, or solo instruments, such as violin, flute, etc. A splendid opportunity. J. C. Hofbauer, No. 500 Smith St., West Hoboken, N J. jun

FOR SALE—U. S. Patent No. 861,467, dated July 30, 1907. Machine Gun. Address, Leon Jusselin, Moreauville, La. jun

FOR SALE—U. S. Patent No. 874,224, December 17, 1907. Never-come-out collar button. Best collar button ever invented. A small thing, but a big money maker; cheap Address, James N. Mills, 401 Flowers Ave. Pittsburg, Pa. jun

FOR SALE—Patent No. 874,447, dated December 24, 1907. Wedge Making Machine. Splits, shapes and extracts with one movement. Time and labor saving machine for blacksmiths, wagon makers, carpenters, sash and door factories. First class machine. For particulars address, A. B. Smith, Sutter, Cal. jun

FOR SALE—Patent No. 872,560, dated Dec. 3, 1907. Dustless Ash Sifter. Will sell outright for cash, or part cash and royalty. Any reasonable offer will be accepted. Will save one-fourth the coal bill. Address, R. D. Jones, Laurium, Michigan. jun

FOR SALE or royalty—Animal toys made from card board or paper material. Cheaply manufactured. Amusing and instructive. Would be great sellers. Address, W. T. Wood, Nashville, Tenn. sep

FOR SALE—Knock-Down Crate. New patent just out. Crate can be knocked down or set up in a half minute without using a hammer or a nail. Strong, durable, handy, and good looking. Cheaply manufactured and large profits. Sell by state rights. Anton Williman, Washington, Mass. jun

FOR SALE—Patent No. 805,584, dated November 28, 1905. Range Finder. Same instrument, if correctly regulated, will tell the distance from the stand to any object correctly; across swamp hills, gulleys, seas, as well as on level fields; also trains the eye to tell one distance from another. Address, Friederich Rump, Sheboygan, Mich. sep

FOR SALE—Patent No. 878,063, dated Feb. 4, 1908. Lamp Burner. Simple, cheap and safe, Destined to supplant all ordinary oil burners. Large profits. For sale or on royalty. For particulars address, J. A. Welsabeck, Ether, N. C. jy

FOR SALE—Patent No. 863,099, dated August 13, 1907. Carpet Stretcher and Tacker. Must sell on account of sickness. Will sell to highest bidder. Gottfred Schilling, Prescott, Wisc. jy

FOR SALE—Patent No. 875,150. Hoist and Loading Machine. This machine will do the work of twenty men in railroad construction work. Can be built at small cost. Address, T. N. Carter. Norton, Va. jy

FOR SALE—Patent No. 869,608, dated Oct. 29, 1907. Also Canadian. Display rack for chairs, tables, go-carts, etc. A real necessity. Simple, very broad patent. Photos showing uses sent upon request. R. L. Wilcox, Port Leyden, N. Y. jy

FOR SALE—U. S. Patent No. 877,254, issued January 21, 1908. An appliance for unwinding barbed wire in building wire fence. A labor saver. Will sell cheap for cash. For particulars, address M. M. Swanson, Hamilton, Iowa. jy

FOR SALE—U. S. Patent No. 874,457, dated Dec. 24, 1907. Pocket Can Opener. Tourists will find it perfectly safe to carry in a satchel. The best folding can opener on the market. Address, L. P. Therriault, Bonfield, Ont., Canada. jy

FOR SALE—State, county and farm rights for best patent out; cement pipe machine; makes 1 1-4 inch pipe for 2½ cent per foot; iron pipe costs 12 cents; agents wanted everywhere; send for circulars. Ellis W. Buser, Dawson, Nebr. jy

FOR SALE—Patent No. 880,794, dated March 3, 1908. Breast strap connection, for connecting the breast straps to the ends of a neck yoke. Will facilitate hitching and unhitching and save much annoyance. Address, H. R. Henrichs, Lamont, Oklahoma. jy

FOR SALE—Patent on Hulling Machine, particularly adapted for hulling German wheat or speltz. Can be manufactured reasonably and in sizes suitable for farm use, grain elevators and mills. Address, Jay P. Petersen, Russell, Minn. jun

FOR SALE—Patent No. 873,617. Safety Pole and Shaft Coupling. The best thing of its kind; may be attached to any wagon or carriage. Releases shafts or poles instantly at a touch. Address, Joseph J. Schmitt, Kinsley, Kan. jun

FOR SALE—Patent No. 804,171, dated November 7, 1905. Listed Corn Cultivator. Has been fully tested. Works perfectly. Will sell outright if sale is made soon. Address, James B. Proskovec, Jr, R.F.D. No. 1, Bruno, Nebr. jun

FOR SALE — Patent No. 874,622. Pneumatic Signal for Railway Crossings. Automatically operated. Advance signals, both visual and audible, which can be applied to any crossing, curve or tunnel, to prevent casualties. For particulars address, Pipkin & Mitchell, Wilton, Ark. jun

FOR SALE—U. S. Patent No. 870,335, dated November 5, 1907. Floor Scrubbing Machine. Canadian patent applied for. Address, P. H. Apple, La Valle, Wisconsin. jy

WANTED.

WANTED—For sale or partner wanted. Some one with $2000 or more to become interested with patentee in the manufacture or sale of useful inventions. For full particulars address, Wm. Fanckboner, Schoolcraft, Michigan. jy

WANTED—Figures as to cost of constructing Patent No. 824,061. Address, Mrs. L. Borden, 359 E. 5th Ave., Spokane, Wash. aug

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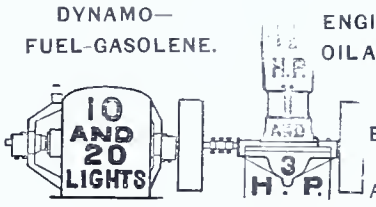
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Patent Office Examiners.

Although the intention of Congress to increase the salaries of Examiners in the Patent Office cannot be too highly commended, further steps should be taken before the work of the bureau can be placed upon a business-like basis. It was estimated, at the beginning of this session of Congress, that forty-nine more Examiners were needed in order to cope with the flood of applications for patent that pours into the Office every year. In his last report, the Commissioner admitted frankly that the work was much in arrears, and declared that the efforts to bring it up-to-date had been futile. The Examiners had repeatedly worked after the close of the official day, and had forfeited their annual vacations with this object in view; but these attempts, the report asserts, were at best spasmodic, and resulted in many actions which were nothing more than frivolous. It was frequently found necessary to do this work over again, which created vexatious delays, and caused complaints to be filed on the part of inventors. What was more serious, a number of applications were passed to issue, in the rush of work, that were not ready for patent, so that the owners of meritorious inventions lost valuable rights by these hasty and ill-considered actions on the part of the Office. The cure for the evil was stated to be a large increase of working force, and as a preliminary to this, the offer of better salaries on the part of the government. For even when vacancies in the examining corps have existed, it has of late been found impossible to fill them. The Civil Service Commission has its registers full to overflowing with eligibles for other positions under the government, but applicants for these places in the Patent Office are conspicuously lacking. Special examinations have been held for the purpose of increasing the number of assistant examiners. In 1906, six of these examinations took place, but as a result of them all, not enough men were produced to fill the vacancies. There are now no eligibles on the register, and the Commissioner of Patents has expressed the doubt if any could be had, if another special examination should be held. It was thought that perhaps the standard of requirements was too high, and it was accordingly lowered. The subjects covered include higher mathematics, physics, technics, chemistry (organic and inorganic) describing mechanical drawings, and French and German. The last two subjects, it should be noted, are necessary in order to secure men who can read specifications of foreign patents.

It will be seen that although the list of required accomplishments has been diminished, the examinations are still highly technical in character, and demand an unusual degree of ability and training on the part of the applicant. Those who pass, in fact, are all graduates of colleges, and are mostly graduates of law—general and patent—as well. A young man with such technical education can find a position in an outside corporation that pays him much better than the government service. The salaries offered, in fact, have been insufficient not only to attract new men, but to retain those already in the Office. Within the last five years, nearly half the Examiners have resigned to undertake private work. The recent increase in remuneration will doubtless check this tendency, which has had a most unfortunate effect upon the efficiency of the service, and will also, it is to be hoped, make it possible to fill the vacancies. If the corps is now further enlarged so as to cope with the great amount of accumulated work and the volume that is constantly coming in, increasing with the annual growth of the country and its expanding activities, a valuable reform will have been inaugurated.

Restraint of Trade.

In spite of the declaration that this is the land of the free, Americans find themselves hedged with legal restrictions in a way unknown in some other countries whose claim to liberty is less famous. The best government is that which governs least; and the multiplication of laws however necessary they may be to meet the new conditions that confront our growing Republic, cannot fail to abridge the freedom of the individual. A case in point is a provision of the patent law, which permits the owners of a certain article to prevent purchasers from using accessories not covered by the patent, though connected therewith. For instance, if you buy a certain copying machine and the ribbon wears out, you must buy another ribbon from the makers of that particular copying machine; you are not allowed to get one in the open market. This is very different from the law in Great Britain, which expressly prohibits patentees from making conditions that might prevent purchasers of their patented articles from using other articles not covered by the patent. Such a provision restricts trade, and in this respect, as well as in some others, the United States law might well be amended on the pattern of the British.

Harnessing Guncotton.

THE INVENTIVE AGE recently quoted a writer in *Science* to the effect that the best means of propelling airships might be found in some form of explosive, the force of which could be harnessed so as to admit of its continuous use. Now comes the news that Hiram Maxim has discovered a means for utilizing the power developed by the explosion of nitroglycerin and guncotton. It can, he says, be used for a motive power as gasoline is used. He has experimented with torpedoes with success, and has even found that the explosives can be employed as a tractable means of boat propulsion.

The problem, of course, was how to regulate the power—how to tone it down so that the explosion would not tear the torpedo to pieces. The inventor claims, however, that he has gotten it under perfect control. So far, the method appears to work only as a means of water propulsion—in fact, the water is an important part of the process, as it turns the combustion of the blended explosives into powerful jets, that project the vessel forward as they themselves leap backward. Further developments along this line, however, may solve the problem of air motors.

Dangers of X-rays.

It is well known that those who manipulate the Roentgen rays run the risk of serious injury. The most recent illustration of this is in the case of Dr. Hall Edwards, of England, who has just been obliged to have his left hand amputated, owing to his having contracted the disease known as "X-ray dermatitis." The doctor was the pioneer operator with the Roentgen rays in Great Britain, and was senior radiographer with the Imperial Yeomenry in the South African war. His right hand is also affected, but it is hoped that this will be saved. This is merely one of the many instances in which scientists have lost a limb as a result of the burns and cancers which followed experiments with this form of light. The report that reaches us from Cornell, that Professor Geyser has invented an appliance which will obviate this danger, is therefore of special importance. The device is intended to protect the patient as well as the operator, and it will be good news to those for whom this treatment is recommended, that they need no longer fear the painful burns that have so often attended its use in the past. Details of the appliance have not been given, but it is said that the professor makes use of a tube in connection with the X-ray machine, and though it has been employed 5,000 times, not a single lesion has resulted. It is to be hoped that the device will be used by Dr. Hall-Edwards, when he resumes his work. The doctor is surgeon radiographer in the General Hospital, Birmingham, and in spite of his sacrifice and great suffering, he has had the pluck to declare that as soon as he is able, he intends to take up his special work again.

For the Benefit of Burglars.

One of the latest inventions for the benefit of burglars is a method of cutting steel, by means of an oxy-acetylene blow pipe, which is said to be the most successful of devices in this line. The usual oxy-acetylene blow pipe has two tubes, one for compressed oxygen and the other for the acetylene. The new device adds a third tube, for additional oxygen. In operation, the acetylene is first allowed to flow out and is ignited; then the oxygen stop-cock is opened and the flame heats the metal to be cut to a bright red. When the temperature is high enough, the stop-cock of the other oxygen pipe is turned on and a stream of oxygen plays on the metal where the cut is to be made, burning it through, in a narrow, slit-like opening. The work can be accomplished very rapidly; a plate half an inch in thickness can be cut at the rate of nearly a foot a minute; an inch plate in two minutes, and a four inch plate in three minutes. In recent experiments two hundred iron girders seven inches thick were burned through in less than five minutes, while by ordinary processes it would have taken half a day to sever them. A specially protected safe was tried, in which the walls consisted of three layers of steel, each a half an inch thick, separated by copper plates a sixth of an inch thick. A square hole was sawed into it in twenty minutes. The one fortunate point about this invention, from the public point of view, is that the blow pipe is not readily portable, so that it is not as convenient for the burglar to handle as his ordinary tools.

One of our consuls in Germany, however, describes recent triumphs of robbers with these novel tools. A single thief has accomplished wonders in this line. He would secure a room above the office of a money-changer, say, and at night pierce a hole in the ceiling. By the use of a drill and saw a circular piece of the flooring is raised, and a small orifice made in the layer of cement below. An umbrella is shoved through and opened, so that as the fragments of cement were dislodged they would fall without noise into this receptacle. Thus the hole was quietly enlarged so as to permit the easy passage of a person. By means of a rope ladder the descent was made, and the safe opened by means of the device described. It produced a flame of such intensity that the steel fused like lead in an ordinary gas jet. It took but a short time to melt away enough of the door to make the contents of the safe accessible.

Manufacturers of safes in the Fatherland now intend to fight the scientific burglar with his own weapons. In somewhat the same fashion by which time-locks prevent the opening of the lock of a safe during certain hours, it will be comparatively easy to introduce into safe construction chemico-mechanical devices which, during a specified time, would render it either fatal or physically impossible to remain in the vicinity of a safe or vault, were the walls or door

tampered with to such an extent as to allow access to the interior. By the use of a very simple form of apparatus containing potassium cyanid and sulphuric acid, a robber would expose himself to the deadly fumes of prussic acid.

Less dangerous, through possibilities of accident to those regularly using a safe, would be the employment of substances crippling a safe blower or forcing him to an instantaneous retreat. The volatilization of a few drops of ethyl-dichlor-acetate would cause such profuse and persistent weeping that one in the immediate neighborhood would be temporarily blinded. The breaking of a tube of liquid ammonia would render immediate withdrawal imperative under peril of suffocation. Several similar compounds are at the service of constructors. Eventually the daring burglar, with sufficient scientific training, might venture to face the unknown dangers of a safe well provided with more or less effective neutralizing agents for the concealed possibilities of defense; but certainly for the present, at slight expense, effective protection can be devised, even against the attack of the bold and scientific cracksman with his portable oxy-acetylene blowpipe.

Phonograph in Ethnological Research

The most novel use of the phonograph is to take records of the languages and songs of wild tribes, so that our descendants may listen in amazement to the voices of primeval peoples. The Academy of Sciences at Vienna has recently filed away records of the speech of the savage natives of New Guinea, which were obtained by a professor who spent several years among the tribes. No ethnological expedition ever returned with richer results, as not only the phonograph, but the camera and even the cinematograph was employed to make records. The native songs are largely religious or ceremonial, and are the accompaniment of ceremonial dances, which were taken by the cinematograph. The whole makes a most unique collection.

A Restaurant in the Clouds.

High on the ledge of the Jungfrau mountain, Switzerland, more than 10,000 feet above the level of the sea, is located one of the most unique restaurants in the world. This mountain is a favorite among tourists, and there is no more welcome spot along its rocky paths than the little restaurant, where all the cooking is done by electricity. The power is generated by a convenient waterfall, and the kitchen equipment consists of a score of novel heating devices. The oven has four heaters, including roasting and baking ovens, which can be regulated to the exact degree of heat desired. There is an electric kettle, holding 16 gallons, for soups and meats, smaller kettles for cooking vegetables, etc., all connected by means of plugs with the switchboard, which has indicating lamps and heat regulators. There are also special devices for boiling potatoes, making coffee, boiling milk, warming plates, etc. The use of electricity for cooking is especially advantageous, owing to the difficulty of transporting fuel up the mountain.

Automobiles in the Arctic.

Probably no other automobile event has excited the interest and discussion that is apparent in the New York-Paris tour via. Alaska and Behring Straits. One of the most interesting phases of the discussion has been the adaptation of various details of operation to the extreme low temperature to be encountered in the Arctic. Among the most vital of the practical problems to be solved is that of efficient lubrication, because of the impossibility of carrying duplicates of all parts subjected to wear. If fluid oils are used, the waste by dripping and leakage will require that each car carry a large supply of lubricant. The chief ingredient of greases is tallow or other similar fat, which at 50 degrees below zero would become so hard as to make its very presence a terrific drag upon the bearings, and to quite deprive it of friction-reducing power. In fact, it would probably put a dead load of three or four times the normal friction resistance on the engines. The practical working out of these problems will be awaited with eagerness by the motor world in general.

Wire Fences in Peace and War.

The wire fence is playing an important part in the world's economy. It has been found to be a most effective factor in war, and in fact may be said at times to decide the destinies of nations. First employed to hinder the advance of the enemy's forces in South Africa, it was during the Russo-Japanese struggle that its full value was realized. Both armies in the East used it to protect fortifications from attack, and both bore witness to its strength and resisting qualities. Experience has demonstrated that a tangle of barbed wire fence is a more formidable factor in resisting a sudden onslaught than a whole regiment of sharpshooters.

The world was not slow to learn the lesson, and modern armies of all countries are now provided with hundreds of miles of barbed wire fence. This fence is especially made, with large, sharp and ugly barbs; and the rate at which a tangle of this material can be strung up by a regiment, measures, it has been said, its efficiency in resisting a night attack. A set of implements for planting posts and attaching wires is a part of the equipment, as are also clippers, with which to destroy the defenses of the enemy.

But it is among the triumphs of peace that the wire fence is best appreciated. The growing scarcity of wood makes it impossible to use this material for all the fences that are being built, and steel has taken its place. The woven wire fence, made so strong that it resists the attempts of the most vicious cattle to break through, and in shapes and sizes to suit the varied requirements of the farm and ranch, has become indispensable to modern civilization, and its manufacture represents one of the leading industries of America.

In many parts of the West, the top wire of the fence is employed for telephone purposes. Millions of acres of land are enclosed in this way, and sections of the country can thus be tapped by telephones at little expense. These lines are more suitable in wild districts than special wires strung from high poles, as they are not so liable to destruction by heavy wind storms and snow. On the large farms, too, the distance from distant fields to the house is often such as to make communication by telephone important. The fence that runs to the nearest point is tapped, and portable telephones are taken from place to place. The manager can thus give orders to workmen in widely separate parts of the estate, without sending messengers back and forth. The same is true of the cattle and sheep herding companies. Many flocks have been rescued from destruction by warning of a blizzard through the medium of fence telephones. These have also been used as fire alarms, and forest reserves have been saved by prompt notice of the danger of conflagration, over these wires. With all these varied uses, it is not surprising that the farmers of America are buying fifty thousand miles of wire fence every month. Four-fifths of all the wire fence made in the world is manufactured in America, and enough is produced in this country every fortnight to go around the world.

Farming by Machinery.

Farming in the West is a very different affair from what it is in the states East of the Mississippi River. Along the Atlantic seaboard, where many of the holdings are only a hundred acres in extent, a farmer is thought progressive if he cuts his corn by machinery, and most of the other operations of the farm—apart from the wheat cultivation—are done by hand. On the broad acres of the Western states, where a thousand acres is put in wheat on a single farm, the methods necessarily differ materially. In Kansas and Iowa, they farm by machinery, and men are employed only to direct the apparatus. Many of the devices are unknown in the East. The wheat reapers are drawn by traction engines across the fields, cutting a swath thirty feet wide, and covering 100 acres in a day's work. Only the heads of the wheat stalks are removed; the straw is left standing in the field, to be cut and used when wanted; meanwhile the machine clips off the heads of the wheat, threshes them, sacks the grain, and dumps it into wagons, ready for shipment.

The tractor is most useful, too, in plowing; twenty-five acres a day is not considered fast work. Then the harrows are attached—huge devices fifty feet square; two or three are operated at a time, covering two hundred square feet of ground, into which their teeth go to a depth of six inches. Yet they are dragged over twenty acres an hour. Seed drills may be fastened to the harrows, so that at one process the ground is planted and cultivated.

The labor of corn cultivation, also, has been reduced to a minimum. Machines move along the edge of the field, cutting off every stalk just above the roots and automatically tying them into bundles. The stalks are carried to the barn and fed into another machine, which cuts off the ears, husks them and forces them through a long pipe into the loft. Here they fall into a hopper where the kernels are shelled and poured into a bag at the side of the machine, the empty cobs being carried off by an endless conveyor. A steam engine of about 10 horse power operates the sheller and husker, which does the work of sixty people, and requires the attention of only an engineer and two men to feed it.

A mechanical Maud Muller rakes hay and stacks it at the same time. Hitched to the rear end of the hay wagon is the automatic loader, which consists of a two-wheeled truck supporting an inclined platform, the lower part of which has an endless belt. As the truck is drawn along behind the wagon, the hay is caught on the moving belt and carried up the incline to the top of the load, where it is stowed away by a man with a pitchfork. As fast as a wagon is loaded, the loader is disconnected and the hay carried to the barn or stack.

No apparatus has yet been invented that will cut potatoes so that an "eye" will surely remain on each piece. But once the potatoes are cut, a machine drops them and covers them up with earth. Potato digging—that most arduous task—is made a trifling matter by the aid of a device which shovels them out of the earth and sacks them. Alternate rows are first dug and picked up: then the others are dug: otherwise too many tubers would be tramped upon by the horses or covered over with dirt. Manure, too, is spread by machinery; a revolving drum at the end of a wagon scatters it more evenly than can be done by hand. It takes capital to farm on such a scale, but it yields good returns.

Sugar Cane in India.

Most of the sugar cane grown in India is converted into a kind of candy, formed by boiling down the juice of the cane. The latter is crushed with crude stone or wooden rollers, moved by bullocks. The juice runs through a gunny filter into jars, and is then poured into a pan and boiled. Castor seeds or carbonate of soda are used to clarify the sirup, which when cooled and solidified forms a kind of sugar candy.

To Detect Tuberculosis.

A method by which the existence of tuberculosis can be detected consists in vaccinating the patient with a few drops of Koch's tuberculin. If tuberculosis does not exist, the little incision heals rapidly, but if the patient is affected with the slightest trace of the disease, although it may not be revealed by any tangible symptom, the wound becomes inflamed and a pustule similar to that of vaccine appears. It is claimed that this method dispels all doubt on the nature of the malady in its incipient stage.

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Stacker.....C. E. Lang
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Target.....J. Arbat
Target, Rotary.....F. J. Johnston
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Telegraphy, Wireless 3 pats.....G. Marconi
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Cigar-band.....F. A. C. Kaiser
Emblem.....Z. S. Eldredge
Fly-plate, Sticky.....C. Schedell
Fobs, brooches, pins, or similar articles, Head for.....H. Kollmar
Money-box.....B. vom Eigen
Pillar-seat.....J. B. Holtzclaw
Vehicle-body.....J. C. Kaiser
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Packing for stuffing-boxes or similar devices..A. R. Trist
Packing Piston-.....J. A. Scott
Packing, Rod-.....J. A. Scott
Padlock.....O. Hummel
Pail heating device, Dinner-.....J. W. McKay et al
Paint and varnish removing preparation.....W. Stuhlmiller
Paint-remover and making the same.....F. X. Govers.
Painting machine, Graining card-.....J. W. and O. Stocker
Paneling.....H. M. Robinson
Paper-feed-carriage alarm.....F. H. Cottrill
Paper-making machine, Embossed-wall-.....A. Leisel
Pasting and feeding machine....J. J. Sullivan
Pen, Quill.....E. W. Bodmer
Pencil.....C. A. Smith
Pencil.....F. Thompson
Percolator.....E. S. Glover
Perforating-machine, Power..W. G. Capitaine
Photographic images, Manufacture of colored.....L. Didier
Photographic-printing frame.....J. Nelson
Photographic shutter.....E. L. Hall
Photographs, Production of colored.....W. Merckens et al
Piano-frame.....G. G. Hasbrouck
Piano sounding-board.....A. Krieghoff
Picture effects, Producing moving-....E. Keen
Picture-hanger.....H. N. Patrick
Pin.....C. M. Fox
Pipe-bender.....E. A. Brown
Pipe cleaner, Beer-.....O. R. Dickens
Pipe-threading die.....J. F. Crudginton
Pipe-threading machine.....H. L. E. Peterson
Pipe-union, Flexible.....D. G. Jones
Pipe-wrench.....G. C. Winslow
Pipe-wrench.....J. M. Cochran
Pistol, Automatic.....C. P. Clément
Placket-closure for skirts.....F. Hofmeister
Planer.....A. Gworek
Planer-head, Adjusting means for..H. B. Ross
Planter.....A. Benton et al
Plants, Setting.....J. L. Sinclair
Plow.....G. A. Anderson
Plow, Sod-line.....J. L. Hart
Plow, Wheel-.....W. L. Paul
Pneumatie brake.....W. H. Miller
Pocket safety attachment.....J. Felsenstein
Poker-table.....I. Mason
Post-hole-boring machine.....R. Guthrie
Posts and poles, Machine for erecting.....R. Guthrie
Printing and stamping machine.....J. C. Hansen-Ellehammer et al
Printing device in cash-registers, Color-.....J. Frydmane et al
Printing-presses, Color-printing attachment for.....A. P. Harland
Propeller.....A. Gnaegy
Propeller.....G. W. Hopkins
Propeller, Screw.....T. F. J. Truss
Propeller-wheel.....H. J. Perkins
Pulley, Ratchet-cylinder.....A. Leatherman
Pulverizing-mill.....L. D. York
Pump, Air-.....J. W. Siepermann et al
Pump, Air-.....G. W. Kellogg
Pump, Centrifugal.....S. V. Trent
Pump for street-cars and analogous purposes, Air-.....W. A. Collins et al
Pump valve mechanism.....C. O. Sobinski
Puncture-telltale.....C. A. Winter
Punka and the like, Electrically-operated.....H. H. Young
Pyrotechnic device.....N. Del Grande
Rail-fastener for concrete ties....E. J. Drayer
Rail-joint.....R. F. Wolynec
Rail-joint.....J. H. Barnhart
Rail-joint.....W. B. Taliaferro
Rail-splice.....W. C. Crosby
Rail tie and brace.....J. Frampton
Railway eattle-guard, Automatie...R. M. Wark
Railway-frog.....O. F. Rost
Railway-rail joint.....E. C. Ale
Railway-signal.....J. K. Johnston
Railway signal and telephone system.....F. L. Odenbach
Railway-tie.....S. C. Newlin et al
Railway-tie, Metal.....J. A. Reed
Railways, Safety-catch for cable-.....M. Snyder et al
Rake.....G. S. Adams
Rake-shoe.....N. Hughes
Ram.....G. L. Le Vesconte
Ratchet-drill.....F. C. Bohm
Razor.....B. J. Weller
Razor, Safety-.....F. H. Arnold
Reactions, Apparatus for effecting.....E. A. Sperry
Reaper, Central-delivery.....A. Hovland
Receiver.....W. T. Boyd
Reel-crank.....J. J. Nealands
Reel-holder.....J. P. Weaver
Refrigerator.....L. A. Banta
Relay.....A. S. Cubitt
Relay, Interlocking.....T. L. Lee
Reversing mechanism.....G. Sittman
Roller-support.....H. J. Denzler
Rolling.....W. McKee
Roof-flashing.....L. H. Bullard
Rope-carrier-direction-changing device.....F. V. Drake
Rotary explosive-engine.....E. E. Barnes
Rotary explosive-engine.....J. P. Walsh
Sand-box.....T. M. Underwood
Sanding-machine.....E. H. Mullikin
Sanding-machine attachment.....W. Munch
Sash-fastener.....C. S. Whipple
Sash-fastener.....F. A. Staples et al
Sash-lock and antirattler.....A. Bennerscheidt
Sash-lock, Self-locking.....A. Gorman
Sashes and the like, Holder and fastener for storm-.....F. Bursik
Saw-clamp.....G. W. Rush
Saw, Hand-.....A. M. Remington
Saw mill, Gang-.....T. S. Wilkin
Saw-tooth tool.....M. E. Simmons
Scaffold-bracket.....A. V. Davis
Scaffold, Platform-.....J. McIntyre
Screw-thread-forming apparatus.....E. F. Moy et al
Screw-threading machine..V. Z. Caracristi et al
Seal, Bottle.....S. D. Webb et al
Seal-fastening.....T. E. Murray
Seal or fastener, Envelop....E. Merrifield et al
Seat and table, Combined....M. R. Rodrigues
Secondary battery.....W. A. F. Alt
Securing device.....F. L. Beard
Separating iron particles from chaff and the like by means of magnets, Device for.....J. Hagmüller
Sewing-machine.....C. G. Kramer
Sewing machine, Book-.....C. Joos
Sewing machine, Carpet-.....C. R. Fisk
Sewing-machine thread-cutting mechanism.....E. B. Allen
Sewing-machine treadle mechanism, Shoe-.....E. P. Richardson
Shade and curtain hanger, Window.....E. G. L. Gregson
Shaft-detaching means.....J. W. Ward
Sharpening or cutting machine.....L. Cory
Sheet-metal box.....P. A. Blichert
Sheet-metal receptacles, Manufacturing.....L. F. Betts
Shelf and ironing-board attachment.....C. R. Shaw
Shingle and heading machine.....J. and J. H. Street
Shingle-gage.....A. A. Unruh
Shingle-machine.....G. W. Dorman
Shoe-polisher.....J. T. McDonald
Shoe-tree.....M. L. Gough
Shooting-gallery.....C. E. Morris
Shutter, Roller-blind.....W. F. Folmer
Sifter, Gyratory.....W. Preston
Sign.....G. Bittle
Sign, Illuminated.....R. R. Wiley
Signal.....F. H. Pettit
Signaling device, Automatic.....G. Milburn
Sleigh, Motor-.....C. A. Hanson
Slicer, Bread and meat.....D. H. Mosteller
Sliding gate.....A. J. Russell et al
Smoke-consumer.....H. P. Bradbury
Smoke-consuming furnace.....A. Sichert
Snap-fastener.....J. M. Adams
Sorghum-stripper.....C. M. Barekman
Spangle-machine.....C. W. Bingham
Sparking mechanism..H. G. and C. C. Coulson
Speed-changing mechanism.....E. Rivett
Split washer.....J. J. Jensen
Spoke-puller.....J. R. Crenshaw
Spoon, Mixing-.....A. W. Cram
Spring-seat.....H. Hirsh
Spring-wheel.....H. E. Heaton
Sprinkler, Open.....W. Esty
Square, gage, and rule, Combined..A. C. Cowles
Square, T-, 2 pats.....E. Werner
Stamp-mill shafting.....F. S. Kirkland
Stamp, Time.....G. E. Perry
Stamps, paper, and the like, Serving apparatus for postage.....V. Hegarty
Staple-puller.....G. Blood
Station-indicator.....C. W. Kincaid
Station-indicator.....C. Miller
Steam-boiler.....W. H. Wood
Steam-boiler.....J. A. Doarnberger
Steam-engine.....J. H. Stick
Steam-engine.....A. P. Dwiggins
Steering-gear for boats.....E. C. Akers
Sticking-plaster box or holder.....C. Hoffmann-Pinther
Still, Hydrocarbon-.....T. H. Ellis
Stitch separating and indenting machine.....H. H. Cummings
Stock, Machine for cutting forms from sheet..W. F. Hutchinson
Stone-saw.....E. Gelius
Stove, Cooking-.....W. R. Merrick
Strawberry-picker.....A. E. Bergquist
Stringed instrument.....A. E. Mathey
Submarine viewing apparatus.....M. Samaha
Sunshade.....J. H. Coffman
Suspenders, braces, &c.....W. Freeman
Switch-stand.....W. C. Kidd
Synchronizer, Automatic.....F. Conrad
Tablet, Writing.....G. S. Ansell
Tag and stamp-protector, Combined shipping-..E. P. Bernheim
Talking-machine.....T. Kraemer
Talking-machine attachment.....E. Prazak
Talking-machine attachment.....B. F. Keating
Talking-machine sound-box.....T. Kraemer
Tank-indicator.....J. B. Laursen
Telegraph-sounder.....J. J. Thomas et al
Telephone hook-switch.....H. L. Knight
Telephone system.....F. E. Mayberry et al
Telephone system, Three-wire central-energy..C. A. Simpson
Telephone toll-box.....O. Brisbois
Telephone-transmitter.....A. E. Beachum
Telephone trunking system.....E. H. Rupe
Telepbones, Coin-box and registering mechanism for.....F. D. Powell et al
Thread-holder for spools.....E. S. Prescott
Threshing-machine tooth.....F. B. Carlson
Tile, Roofing-.....C. N. Bruzaud
Tire-cushion for vehicles.....W. E. Garvey
Tire, Pneumatic vehicle-.....M. B. Priest
Tire-protector.....H. Parsons
Tire, Reinforced pneumatic..H. D. B. Lefferts

Tire, Vehicle-....M. B. Priest
Tires, Holder for spare....E. H. Stickels
Tool, Combination-....A. Olson
Tool, Combination-....L. Myers
Tool-holder....G. R. Lang
Tool-retainer, Pneumatic....E. J. Shoffner
Tooth, Artificial....H. E. S. Chayes
Train-stop, Automatic....H. G. Sedgwick
Tramways, Bucket-loader for wire-rope....F. B. Whitmore
Transformer....J. J. Frank
Trap....W. B. Eason
Trolley-stand....W. A. Loudon
Truck and jack, Combined....J. M. Smith
Tube eatcher and support....H. W. Staley
Tube-forming machine, Mount-..J. E. Graybill
Tunneling-machine....W. J. Hammond, Jr.
Turbine-bucket....C. P. Steinmetz
Turn-table....W. Magnuson
Turpentine-cup....E. A. McKoy
Type-case....J. G. Gallemore
Type-writing machine....W. Kraft
Type-writing machine....J. H. Jackson
Type-writing machine....G. A. McLean
Type-writing machine....J. B. Hennessy
Umbrella, Folding....W. J. Geib
Universal joint....G. F. Tadini
Valve, Engineer's brake....J. P. Gault
Valve, Fluid-pressure....W. F. Davis
Valve, Gas-engine....W. B. Engler et al
Valve mechanism, Safety-discharge-....J. C. Bowers
Valve, Piston-....J. A. Scott
Vapor and gas purifying apparatus..J. A. Serrell
Vault, Burial-....M. L. Brewer et al
Vehicle-body hanger....J. G. Anderson
Vehicle, Front-driven motor-....A. W. Brightmore
Vehicle, Motor-....G. J. Taylor
Vehicle-raising jack....J. S. Williams
Vending machine, Cigar-....W. Butler
Vending-machine, Coin-controlled....R. D. Simpson
Ventilator....J. F. Huber
Vessel-hull....I. E. Palmer
Violin-mute....I. Mitchell
Voting-machine....J. W. Nunamaker
Washboard....H. J. Gilbert
Washtub-cover, Metallic....W. H. Ramsdell
Watchcase....W. H. Fitz Gerald
Water-column....A. K. Mansfield
Water-motor....O. E. Brown
Water-motor....M. L. G. Wheeler
Water-purifying apparatus..E. D. Packard et al
Water-purifying apparatus..O. L. Stump et al
Water-tube boiler....A. L. Riker
Watering-trough....A. C. Michael
Weaving, Pattern for jaequard-....C. Vorwerk
Weed-killer....J. F. Dunn
Weighing-apparatus....F. J. Heybach
Weighing-apparatus....H. B. Osgood
Well-drilling apparatus....C. Milliron
Welt-marking machine....G. F. Stewart
Wheel-guard....W. R. Evans
Wheel-lock....W. H. Gibson
Wheels, Ice-cleat for traction....T. D. Ulrich
Whiffletree-hook....J. H. Rabe
Winding and placing under pressure a thread coated with non-fibrous and adhesive material, Machine for....E. D. C. Bayne et al
Window construction....C. E. Stose
Window-screen....H. G. Steely
Window-screen....C. E. Hall
Window-ventilator and curtain-fixture....O. F. Brown
Wire-stretcher....J. T. Gardner
Wood-chipper....A. M. Powell
Wood-splitting machine....P. Eckenroth, Jr.
Woodworking-machine....J. W. Wadkin et al
Wrench....H. A. Smith
Wrench....F. D. Noble
Wrench....J. C. Frey

DESIGNS.

Automobiles, Radiator-casing cap for....S. D. Waldon
Bag....F. L. Kirk
Cabinet, costumer, and shaving-stand Combination....J. H. Wilson
Clothes-hanger base....M. A. Wiggin
Faucet-handle....B. H. Jansen
Fence-post....J. F. Shelton
Inkstand....C. H. Nunan
Tile, Roofing-....S. A. Jones
Type, Font of....T. C. Robinson

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MECHANICAL PATENTS.

Account-keeping apparatus, Individual....W. W. Robinson
Account-keeping device....W. W. Robinson
Accumulator-controller....W. B. Mason
Acetylene-generator....R. H. Welles
Advertising device....I. O. Thorley
Aerial apparatus....M. B. Sellers
Air-compressor....J. T. Simpson et al
Air-cushion block, Compressed-....C. C. De Witt
Auger Earth-....J. S. Park
Autographic register....T. F. Schirmer et al
Automobile....A. H. Wright
Automobile circuit-breaker....W. C. Horner
Automobile steering-gear....G. E. Miller
Automobile-radiator....C. Schmidt
Awl, Sewing....C. A. Connan
Awning....W. W. and F. L. Schwemer
Axle-box lubricating-packing holder, Car-....J. S. Patten
Bag-fastener....G. L. Edgerton
Bait, Artificial....J. E. Pepper
Bale-tie....W. D. Ferris
Bale-tie-making machine....W. D. Ferris
Band-cutter and feeder....A. Böttcher
Barrel, Drying-out....C. L. Warner
Barrels, kegs, and the like, Combined cover and follower for....T. M. Dansby
Basket....L. E. and L. B. Reynolds
Bearing, Roller-....F. M. Foote
Bearings, Lubricating device for center-....R. T. Senter
Bed....M. Wensauer
Bed, Knockdown....S. S. Hanson
Belt-fastener....P. A. Hudson
Bending-machine....A. Wood
Binders, Shocking attachment for....W. H. Perrin
Blanching apparatus....E. J. Vaudreuil
Bobbin and spindle connector...H. E. Hughes
Bobbin-driving means for rotatable spindles...A. D. Morse
Book and card system, Combined loose-leaf....C. P. Ferrero
Bookkeeping system....C. Sherwin
Boring-machines, Drill and bit holder for....J. Marston
Bottle and sealing-cap....J. M. Deemer
Bottle-handling apparatus....H. J. Chilton
Bottle holder and rack....I. J. True
Bottle holder, Nursing-....M. L. Surprenant
Bottles and other receptacles, Stopper for....L. Canucci-Cancellieri et al
Bottling apparatus....A. A. Pindstofte
Box....H. P. Roberts
Brace....D. O. Wilkins
Bracelet....T. D. Giguere
Brick-kiln....S. T. Rawles
Brick-kiln furnaces, Firing-tool for....E. H. Callaway
Brush, Dusting....R. N. Fickett
Brush, Horse-....J. B. Pfau
Buckle....P. I. Andrews
Bung-closure for barrels....O. A. Hilgermann
Butcher's block....L. Rowe
Butter-cutting machine....R. F. Stewart
Button, Detachable....L. Y. Smith
Cabinet....L. E. Hudson
Cake-holder for conveyers....H. B. Ward
Calculating device....T. T. Crouch
Cames, Apparatus for packing..T. W. Morrell
Can-cleaning machine....J. M. C. Jones
Candle-extinguisher, Self-acting..A. C. Findlay
Capsule-cleaning device....J. P. Remington
Car-bolster, 2 pats....O. S. Pulliam
Car-fender....L. Olschewski et al
Car-underframe....W. McIntosh
Cars, Check-lock for....H. S. Boucher
Carbureter....A. W. Breiding
Carbureter....S. G. Averell
Carbureter....W. L. Wayrynen
Carbureter, Rapid-fire....J. A. Speed
Card rack, Playing-....H. De Joannis
Card system....G. C. Anderson
Carriage-body....N. Gilbert
Cementing apparatus....C. W. Phipps et al
Chain, Conveyer-....J. T. Nicholson
Chain, Log-conveyer....J. Schilleman
Chair....C. W. Fiseher et al
Chair head-rest....S. Wheeler
Change-making machine....T. I. Potter
Chemical reaction between materials, Obtaining a violent....C. G. P. de Laval
Chromatrope....S. A. Hunt
Chuck....D. A. Moore
Chuck, Reversible tapping-..J. A. Dalton et al
Chute, Sidewalk coal-....T. F. Clark
Clamp....J. R. Peirce
Clarinet....F. W. Stahl
Clasp....B. L. Green
Clock attachment, Electrical....O. P. Ragan
Clock, Electrically-operated....D. Sandretto
Clothes-pin....W. A. Pugh
Clutch, Friction-....F. Maxant
Clutch mechanism....F. K. Lathrop
Coaster....S. B. Brown
Coat-hanger....J. C. Dawson
Cock, Stop-....W. W. Miller
Coil-spring....R. Gregg
Collar-support....E. Christie
Composition of matter....H. L. Lilienthal
Composition of matter....S. Brown
Compressor, Rotary....C. C. Palmer
Concrete-mixing machine....R. J. Sellentine
Concrete structures, Fitting for reinforced....G. M. Graham
Conveyer-belting and machine-belting, Manufacture of....F. Reddaway
Conveying apparatus....T. S. Miller
Conveying mechanism....C. W. Crosby
Coop....C. B. Treat
Corn, Apparatus for tipping seed-....B. G. Mease
Corn-husker....S. H. Minnis
Corn-husking implement....A. C. Baughman
Corn-sheller feed-regulator....W. J. Steckel
Corn-tops, Device for facilitating the tying of..D. W. Flynn
Corset attachment....M. E. Risk
Cotton-chopper, Automatic electric....D. R. Bragunier et al
Cotton-picker....I. A. Murchison
Cotton-seperator....W. E. Rickey
Counter....T. H. Mayo
Coupling....O. N. Brandt
Coupling-head....J. M. Malloy
Crucible compounds, Manufacturing..C. Caspar
Cruet....T. M. Mulkerins
Cuff attachment for shirts and the like, Hingeable....A. E. G. Bennett et al
Cultivator....W. A. Dewberry
Cultivator....J. F. Deal
Current turbo-generator, Direct-, B. A. Behrend
Curtain-ring....M. E. La Rue
Cycle saddle-support....J. F. Mamet et al
Damper-regulator....H. M. Browne
Dental structures, Apparatus for forming....J. A. Lentz
Dental vulcanizer....F. W. Korb et al
Derrick and car, Collapsible wreeking....E. F. Terry
Desk and cash-holder, Recording-....J. E. Benjamin
Desk, Writing-....C. Y. Haggard
Diaphragm and making the same....H. Hirtz
Discharge-stem....C. Smith
Dispensing-stopper....H. G. Scott
Display-case....E. D. Omertrifter
Display-raek....E. B. Weston
Door-bolt....J. A. Roy
Door-check holder and buffer, Duplex....I. P. Kibbe
Door, Grain-....R. D. Stryker
Door hanger, Edgewise-movable-....S. U. Barr
Door-locking mechanism, Roundhouse-....J. U. Nettinstrom
Door-plate....W. Jones
Door, Revolving-....H. W. Dyer
Draft, Automatic force or suction..G. S. Stuart
Drag, Road-....F. E. Ott
Drawer, Self-closing....V. A. De Canio
Dredging apparatus....S. Lake
Drilling-machine....D. A. Moore
Duplex tube....H. Emerson
Dyeing and extracting machine, Hosiery figure....C. S. Althouse
Dyeing, Preparation of the indigo-vat employed in....H. Chaumat
Dyeing-machine....J. Hussong. (Reissue.)
Edueational device....I. W. Bevans
Egg-opener....D. P. Stevens
Egg-turner....W. Bunker
Electric apparatus, Cooling system for....K. C. Randall et al
Electric contact-shoes, Support for....E. W. Farnham
Electric controller....R. I. Wright
Electric furnace....P. Girod
Electric generators and motors, Field-adjusting device for....F. O. Ball
Electric heaters, Element for..A. A. Low et al
Electric power, Contact-post system for transmitting....G. E. Titcomb
Electrical connection....H. R. Read
Electrical distribution....J. S. Highfield
Electrical-distribution system, 2 pats....A. S. Hubbard
Elevator indicating system....C. E. Moore
Elevator safety device....A. Hollinger
Elevator safety-stop....K. Wisniewski et al
Elevators, Safety flash-light apparatus for....C. E. Moore
Embroidering-machines, Take-up hook for....C. N. Wheaton
Engine-indicator....J. W. Thompson
Engine releasing-gear....R. Schneider et al
Engine reversing mechanism, Traction-....J. C. Metcalf
Engine tender, Traction-....M. Jorstad
Engines, Current-distributing device for igniting explosive-....H. de La Valette
Engines, Ignition for explosion-....R. Varley
Engines, Operating combustion-....P. Winand et al
Engines, Working expansion-...F. Hildebrand
Envelop-fastener....E. B. Stimpson
Excavator, 2 pats....C. C. Jacobs
Exerciser....W. Barrett
Exercising apparatus for oarsmen..D. Scanlan
Explosive....A. E. Charbonneaux
Explosive-engine....C. R. Bryant
Extension-table....F. J. Seng
Eye-shield....G. E. Henry
Eyeglass-guard....W. I. Dengler
Eyeglass-stud....D. D. Updegraff
Eyeglasses....L. B. Becker
Fare-indicator for carriages....R. Picard
Feed-bag....G. Rodriguez
Feed-gage....E. L. Megill
Feed mechanism, Electrically-controlled....B. M. W. Hanson
Feed-water regulator and alarm....W. D. Hodgson
Feeding-off mechanism....W. A. Tompkins
Fence-maker's combination-tool....J. E. Weyeneth
Fertilizer-distributer....E. B. Hackbrun et al
Fiber from vegetable tissues, Use of hot air in extracting....M. R. Kennedy
Filing case, Document-....J. D. Ripson et al
Filling attachment....E. N. Roth
Firearm-magazine....A. W. Savage
Fish-drying apparatus....J. Urquhart
Floor, Drying-....H. O. Robinson et al
Flooring....S. W. Heaton
Fluid-actuating apparatus....R. Conrader
Flying-machine....B. Guthrie
Foundry-separator....E. G. Pfau
Funnel....J. P. Murtha
Furnace....F. Gold
Furnace....C. W. Smith
Furnace-charging apparatus....F. B. Goldey
Furnace-door....A. Cotton
Furnace-door protector....H. J. Marx
Furnace spout, Smelting-....D. H. Browne
Furniture, Folding....W. Rabich
Gaff-hook....C. H. F. Kraft
Garment-hanger....W. De Frear
Garment-hanger....D. W. Custer
Gas and steam engine, Combination....M. S. Flaig
Gas apparatus....E. H. Amet
Gas-burner, Steam-blast....G. S. Bennett
Gas-engine....C. Griswold et al
Gas-fixture....C. Gerlach
Gas-generator....W. Tures
Gas generator, Hydrocarbon-....A. D. Sumner
Gas-lighting mechanism, Automatic....N. H. Shaw
Gas, Producing....E. H. Amet
Gas-producing apparatus....E. H. Amet
Gas, Recovering ammonia and heating air in the manufacture of producer-....W. J. Crossley et al
Gas, Treating....J. S. McIlhenny
Gas under uniform pressure, Generating and delivering....W. C. Finck
Gas-washer, 2 pats....F. H. Moyer
Gear for motor-vehicles, Transmission-....L. H. Dyer
Gear, Variable-speed....J. E. Barker
Glass, Method of and apparatus for drawing sheets of....H. J. Walter
Glass-mold....W. Millstein
Glasses in place, Suction device for securing..J. J. Tanzey
Glove, Cotton-picking....J. A. Layton
Grain-screen....G. H. Rechtenbaeh
Grain-separator....R. J. Owens
Graphophone-needle....W. Fitzpatrick
Graphophone, phonograph, and the like....J. O. Hirschfelder
Grate....H. W. Whelan
Grinding or mixing mill, Edge-runner....C. B. Cole
Grinding-roll....L. C. Wales
Gun-cleaning rod....B. E. Clement
Gun-stock....R. H. Julien
Hame....K. O. Rue
Handkerchief-receptacle....J. Cave
Harness....A. M. Craig
Harvester, Flax-....I. W. Weeks
Harvester-reel....J. T. Brett
Harvesting machine, Cotton-....G. H. Zempter
Hat-curling machine....E. M. Lyman et al
Hat-fastener, Comb....W. H. Goodale et al
Hat packing-ease....A. I. Coe
Hay-press....L. B. Wygant
Heated chamber, Fluid-....C. E. Ord
Heating and ventilating apparatus....E. F. Osborne
Heating apparatus, Portable hot-fluid....H. T. Offterdinger
Heating system....T. F. Scollard
Heel-seat trimmer for patent-leather....D. H. Hadsell
Hitching device....A. Wagner
Hoe, Garden-....T. Grasshaw
Hog-ring....P. A. Swanson
Hoist controlling system....B. R. Shover et al
Hoisting apparatus....H. P. Clough
Hoisting-bucket....C. Chase
Horse-power....J. S. Tuttle
Hose, Chemical-mixing attachment for....B. F. Wooding
Hose-nozzle....S. Suzuki
Hose-sections, Apparatus for capping....S. J. Sill
Hosiery-drying boards, Cushioning-protector for....J. J. Crimlisk
Hydrocarbon-burner....R. H. White
Ice-creeper....J. A. E. Anderson
Igniter, Electric....J. N. Lansinger
Incubator signaling device....G. Mücke
Ingots, Manufacture of compound....W. H. Connell
Ink-well....A. E. Swan
Insulated canopy-collar....T. H. Bullock, Jr
Insulation, Transformer-coil....J. E. Mateer
Internal-combustion engine....C. J. Mundhenk
Internal-combustion engine, Rotating....E. L. Vervoort
Interrupter....A. R. Lusehka
Ironing-machine....J. S. Langworthy
Ironing-machine....W. E. Andrée
Jar-closure....H. E. Jolly
Jars and the like, Closure for milk-....F. K. Plympton
Jarring device....E. E. Messmore
Jewel and pivot gage....F. R. Coats
Jewel-cupping machine....J. Wennstrom
Keyless lock for traveling-bags, &c....J. Kruse
Knitted fabric, 2 pats....R. W. Scott
Label for cotton-bales....T. F. Steele
Laboratory apparatus, Physical....L. E. Knitt
Lacing-hook-setting machine....W. F. Fraser
Ladder....J. Waters
Lamp attachment....W. D. Markham
Lamp, Electric-arc....H. Beck
Lamp, Gasolene-....I. T. Smith
Lamp, Incandescent gas-....H. Süssmann
Lamp, Miner's....R. L. Graves
Lamp-receptacles, Means for supporting....J. S. Stewart
Lamp-socket....W. C. Tregoning
Lamp starting device, Mereury-....C. P. Steinmetz
Lateh, Door-....W. F. Marten
Lens grinding and polishing machine....W. F. Hoffman
Letter, Sign-....G. L. Mason
Level attachment....D. H. Southward
Level, Spirit-....M. Kleinbauer
Lever, Seleetive-....T. W. Warner et al
Life-belt apparatus....J. Focketyn
Limekiln....P. J. Buckley
Linotype-machines, Cabinet for liners and blades for....T. F. Muldoon
Loader....T. J. Qualley
Loading device....W. F. Klewitter
Loading device for grain, &c...H. E. Hawkins
Lock....A. H. Sparling
Lock....A. Lawrence
Lock....H. F. Keil
Locking device....J. D. Ripson et al
Locking device....E. E. Vore
Logging means....S. J. Davis
Loom stop-motion....F. O'Donnell
Loom stop-motion....B. F. Bobo
Lubricating device..B. F. Campbell. (Reissue.)
Lubricator....R. F. Moore
Mail-bags and the like, Apparatus for catching and delivering....B. L. Toquet
Mail-pouch catcher....E. J. Swomley
Mail-pouch-delivering apparatus..C. A. Willis
Mail-sack....G. Smoot
Mail-sack-delivering apparatus....T. J. Grace
Mailer, Coin-....G. W. Collings
Manacle....B. L. Ward
Mandolin....F. Lang
Manure-spreader....E. Buswell
Marble from gypsum, Manufacture of artificial....W. McKee
Marker, Land-....R. G. Ricks
Master-sheet....P. J. Meahl
Measuring device....E. C. Adams
Measuring device....R. Laufer
Metal-reducing machines, Back-rest for....B. M. W. Hanson
Metal-slitting machine....F. J. Wendell
Metals from their sulfid ores, Recovering....E. F. Kern
Micas, Making artificial....F. J. Machalske
Milk-receptacle....E. Z. Taylor
Miter-box....J. McCune
Mixer, Apparatus for feeding materials to a....A. L. Post
Mold....E. D. Tucker
Mold-jaeket....H. C. Caldwell
Mop head and wringer....A. S. Mathers
Motion-converting mechanism....L. R. Briggs
Motor-control system, Duplex..F. R. Fishback
Mower....O. C. and E. R. Weikel
Mower....C. Lorenson
Muffler....J. C. Scott
Music-cabinet....L. Schram et al
Music-leaf turner....H. Varder
Music-sheet turner....F. Lowe
Music students, Chart for....C. H. Caldwell
Nailing-machine....S. M. Cutter
Necktie....C. H. Gaskill, Jr.
Nest, Poultry-....O. K. Olson
Net....A. O. Warner
Nozzle, Rotatable distributing-....A. Schmidt
Nut-lock....T. Casey
Nut-lock....H. Henthorne
Nut-lock....W. K. Kenney
Nuts, Making lock-....A. L. Eicher
Off-bearing machine....W. R. Waggoner
Oil-can....J. W. Cushman
Oil-cup....I. S. VanLoan
Oscillation-receiver....G. W. Pickard
Packaging-machine....A. Day
Pad....O. Neuberger
Pail, Oyster-....J. G. Reber
Paint....A. L. Berry
Paint and color exhibiting device....I. N. Hockaday
Paper-feeding machine, 2 pats....T. C. Dexter
Paper-holder....S. B. Tily et al
Paper machine, Roll-toilet-....G. H. Sibley
Paper-roll plugs, Machine for making....H. Brubaker
Paper vessel....I. W. Hollett
Pasteurizing apparatus, 2 pats...J. T. H. Paul
Pattern-marking device....J. Avansino
Pen, Fountain-....J. A. Holland
Pen retainer, Fountain-..L. D. Van Valkenburg

Penholder....W. Krieger
Percussive-apparatus coupling...C. R. Newton
Piano case, Player-....H. J. Kiefer
Piles, Brace for sheet-metal....A. P. Stocker
Pipe fitting, Water-seal vacuum return-....W. E. Tillinghast
Pipe-gripper....W. F. Barron
Pipe or tube cleaner....E. A. Jablonsky
Pipe-wrench....J. Horst
Pipes, Heating and bending....W. L. Brown
Pistol....K. Hino and T. Komuro
Planter, Corn-....F. K. Lathrop
Planter, Wireless check-row..G. F. Seems et al
Planters, Dropping mechanism for corn-....T. C. Roseland
Planting machine, Potato-....J. Sieffert
Plates or tables, Apparatus for manufacturing compound....M. Winkelströter
Pliers....C. W. Baker
Plow....T. J. Johnson
Potato-digger....D. Y. and D. E. Hallock
Power in dredges, Means for utilizing waste..R. M. Wilson
Power, Means for producing motive-....J. L. Tate
Power-transmission device, Variable-speed....D. M. Dearing
Press-box....F. Phelps
Pressure-regulator....J. E. Ward
Printing-press....W. L. Green
Printing-press....A. W. Vaughn
Prison-bar....C. L. Jackson et al
Protocatechuic aldehyde, Manufacturing....G. Stalmann
Puff-comb....W. S. Bechtold
Pulp-treating apparatus....A. S. Caldwell
Pump, Air-lift....O. E. Harris
Pump, Balanced....A. P. Smith
Pump, Centrifugal....R. Salzer
Pump for oil-wells....A. G. Willard
Pump, Pulsating....A. P. Brush
Pump, Rotary....R. C. Bromley
Pump, Variable-delivery....R. J. Flinn
Punching-bag apparatus....F. Hulsmann
Purse and bag fastener....F. H. Bleyer
Rail-drilling machine....D. A. Moore
Rail-fastener....H. F. Bender
Rail-joint....B. Wolhaupter
Rail-joint....T. C. Adams
Rail-joint....C. G. Skiles
Rail-joint and cross-tie....S. Michaels
Rail-lock and tie-plate....W. N. Reynolds
Railway automatic switch-iron, Street-....W. K. Reichner
Railway-crossing gates, Automatic....K. Grzeslowski
Railway danger-signaling and telephoning apparatus....E. Sughroue
Railway-rail joint....W. H. Reel
Railway-spreader....J. C. Depew
Railway-tie, Concrete....W. H. Pruyn, Jr.
Railway-track rails from spreading, Appliance to prevent....J. M. De Witt
Railway-track spacing device...J. Klinkhammer
Railway-wagons and other vehicles, Antifriction mechanism for....A. Spencer
Rake-tooth cleaner....H. Tait
Razor, Safety-....G. Tittmann
Razor, Safety-....H. Clauss
Reflector and diffuser, Combination light....H. D. McFadden
Register-hook....W. L. Hamilton
Retort-furnace, Regenerative....O. H. Eliel
Reverberatory furnace, Oil-burning..G. Fraser
Rheostat....G. F. Packard
Rheostat....E. L. Mahon
Rheostat....J. W. Mertz
Ribbozine-machine....C. Wiebke
Road-roller, Gasolene....N. De Wind et al
Road-working machine....W. B. Brothers
Rock-crusher....J. G. Brown
Rotary machine....P. J. Darlington
Rotary motor....P. J. Darlington
Safe-deposit boxes, Cover for...H. W. Holder
Sash-lock....W. G. Allen
Sash lock, Window-....J. Rumery
Saw....J. Dowling
Saw, Crosscut-....G. M. Howatson
Saw, Metal-cutting....W. H. Lucas
Saw, Power miter-....A. A. Hillback
Sawing-machine....G. Binder
Sawing machine, Wood-....A. L. Evrett
Sawing-machines, Carriage-feed for..G. Binder
Scaffold, Adjustable....M. Russell
Scale-bearing support....W. F. Stimpson
Scrubbing-machine....J. D. Metcalf
Seal-fastening....T. E. Murray
Seal, Pail-....J. W. Nichols
Sealing vessels, Means for....J. A. Hicks
Seam-closer....A. F. Houck
Seat....F. H. Cullen
Seed huller, Cotton-....Z. T. Job
Seed-separator....F. G. Lyman
Self-feeding device....I. G. Berry
Serving apparatus....C. N. Hooper
Sewing-machine shuttle....C. F. Zanzig
Sewing-machine thread-cutting mechanism....G. S. Gatchell
Sewing-machine welting attachment....W. Wilson
Shackle....G. C. Kenyon
Shade-adjuster and sash-operator, Combined...R. Huitt
Shade and curtain fixture....W. R. Evans
Shearing-machine....C. Wais
Shearing machine, Sheep-....T. Grace
Shears, Pivot-screw for....J. W. Filetz
Shock-lifter....A. N. Hadley
Shocker....R. Woods
Shoe-shank....H. Brennan
Shoes, Spring-retainer for sliding....O. C. Little
Slide-frame construction....O. S. Pulliam
Sieve-adjuster....J. G. Keith
Sign, Illuminated....W. Booth
Signal apparatus, Busy-....C. J. Erickson
Skeins, Apparatus for lustering....D. Ashley
Skirt-marker....R. Sideman
Smelting converter and forehearth....R. Baggaley et al
Smoke-consuming furnace....C. Phelps
Smokeless furnace....C. J. Oberg
Snap-hook....W. C. Stiles
Soap materials to powder, Apparatus for reducing....W. B. Allbright
Spark-gap apparatus....W. W. Massie
Splice-bar....G. A. Santa
Stanchion, Cattle-....L. C. Beehee
Steam-water....C. E. Sargent
Steam regenerator, Exhaust-...F. Draper et al
Steam-superheater....J. N. Stern
Steering-rod connection....J. F. Skirrow
Stenciling-machine....A. J. Smith
Stereotype....M. A. McKee
Stone, Hardening artificial....E. Shwanenberg et al
Stone, Manufacture of artificial....J. C. Henderson
Stop-motion....A. G. Shideed
Stovepipe-connector for nesting pipes....H. Ditchburn
Strainer for steep-tanks....W. H. Prinz
Straw or feed cutter....H. C. Krase et al
Street-cleaner....J. W. Smith
Sulfur-burners, Feeding device for....A. Tromblee
Supporting device....E. Norton
Surveyor's stake....T. Josenhans
Switch-cord plug....E. L. Smith
Syringe, Urethral....J. H. Hoseason
Telephone-calls, Registering....I. Kitsee
Telephone-stand....W. B. Oliver
Telephone system for fire-hose....H. Groswith
Telephone system, Toll....E. P. Baird
Temperature, Means for using from a distance the variations in....J. B. Fournier
Tin-plate catcher....E. L. Cronemeyer
Tire, Concave vehicle-....A. G. Thomson
Tire, Resilient vehicle-....H. A. Palmer
Tires, Pneumatic and other...H. C. Shearman
Tires, Valve for....J. S. Dunn
Tool, Compound....W. H. Grasser
Tool controlling mechanism, Pneumatic-....C. H. Sergeant
Tool, Pneumatic....H. M. Dunlap
Toothpick-boxing machine....S. S. Tainter
Toy mask....H. D. Sterrick
Track-drill....D. A. Moore
Track hanger, Overhead-....D. Tolton
Track-tamping implement....A. F. Hart
Trains, Means for establishing electrical communication with moving....J. Ames
Transformers, Coil-support for electric....H. C. Soule
Transformers, Cooling system for....K. C. Randall
Traveling-case....W. Mable
Tray, Sectional....J. E. Norris
Trolley-harp....P. C. Bliven
Trolley-pole head....G. Mott et al
Trolley-wheel....W. W. Neighbour
Truck....S. A. Wilson
Truck, Car-....F. M. Whyte
Tube-cutter....P. A. Johns
Tuning-coil and condenser, Combined....W. W. Massie
Turn-table....S. Elliott
Type and type-bars, Manufacture of....F. H. Richards
Type-bars, Manufacture of....F. H. Richards
Type-making mechanism....F. H. Richards
Type-writers and type-setting machines, Syllabic keyboard for....H. G. McCool
Type-writing machine....C. J. Bond
Type-writing machine....A. T. Brown
Type-writing machine....M. H. Flynn
Type-writing machine....C. S. Labofish
Types and lines of type, Apparatus for making, F. H. Richards
Types and lines of type, mechanism for making....F. H. Richards
Umbrella....C. H. Hill
Umbrella....W. B. Thines
Umbrella....G. W. Rugg
Umbrella....A. H. Hixson
Valve....H. J. and H. B. Ehrlich
Valve....E. H. Howard
Valve, Balance throttle-....S. J. Davis
Valve, Pneumatic....G. F. Döhring
Valve, Safety-....J. Fraser
Valve-seat grinder....F. Kopriva
Valve, Water-cooled reversing-....J. Barnes
Vehicle-curtains, Removable support for....H. S. Koiner et al
Vehicle, Motor-....W. W. Wainwright
Vehicle, Power-driven....R. H. Simpson et al
Vehicle suspension....R. G. Handy
Velocipede driving-gear....R. J. A. Delacroix
Vending-machine....T. A. Steele
Vessel-raising device....C. Downer et al
Voltage system of distribution, Multiple-....B. Frankenfield
Voting-machine, 2 pats....W. H. Dana
Voting-machines, Label-holder for....W. J. Lausterer
Wagon-brake....J. F. Hagler
Waistband....S. Lindy
Washboiler....M. A. Morton
Washing-machine....E. Roberts
Washing-machine....M. A. Patten
Washing machine, Clothes-....L. M. Adams
Watch-barrel....L. A. Faller
Watch-guard....H. N. Bolton
Water, Apparatus for the chemical treatment of....A. Potter
Water-elevator....H. M. Lambert
Water-heater, Automatic....G. S. Walker
Water-softening apparatus....K. W. Bartlett
Wattmeter-testing apparatus....O. A. Knopp
Wave-power-utilizing apparatus....T. Willans
Weed-destroyer....C. P. Anderson
Weft units, Mechanism for replacing....A. C. Hough
Weft units, Replacing....A. C. Hough
Weighing and bagging machine, Grain....M. Davis
Well packer, Oil-....A. Collingwood
Wells, Apparatus for forcing fluid from....J. W. Waitz
Wells, Casing-head for oil-....R. F. Hadley
Welt-beater....D. H. Hadsell
Wheel rim, Motor-car-....D. C. Smith et al
Wheel rim, Vehicle-....E. C. Shaw
Windmill-regulator....L. S. Hagerman
Window catch, Swinging-....P. Boggio
Window-screen....C. M. Conklin
Window-screen and making the same,....C. M. Conklin
Wire-reel....C. W. Stark
Wire-stretcher....A. W. Sprague
Wire stretcher and splicer....H. F. Bonesteele
Wood-shaving machine....H. W. Selle
Wrench....H. B. Sohn et al
Wrench....S. A. Gruber
Wrench....H. Hestand et al
Yoke, Neck-....M. A. Christenson

DESIGNS.

Bag-handle cap....C. Hiering et al
Brooch-pin....H. W. Fishel
Electrolier, Cluster-....J. W. Thomas
Fabric, Pile....F. H. Walker
Lamp-shade....F. S. Verbeck
Lavatory pedestal....E. C. Stover
Locket....S. A. Keller
Pistol-handle....F. C. Nichols
Spark-plug....W. Diebel
Spoon, fork, or similar article....S. R. Jacobs
Spoons, forks, or similar articles, Handle for....J. E. Straker, Jr.
Vehicles, Radiator-frame for motor-...R. Huff

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MECHANICAL PATENTS.

Acid and making the same, Soluble salts of the anhydro-oxymethylen-diphosphoric....S. Posternak
Adding-machine....G. Roth
Adding-machine ribbon-controlling mechanism....C. P. Wetmore et al
Alloy, Aluminum....W. Gosmann
Alloys, Producing low-carbon ferro..E. F. Price
Aluminum and other metals, Reducing....H. S. Blackmore
Amusement apparatus....C. C. Langsdorf
Amusement apparatus....C. A. Carlson
Amusement device....H. O. Neebe
Animal-trap....A. W. Little
Arch construction, Automatic adjustable....W. M. Thomas
Automatic carrier and dumper....H. G. Diffenbaugh
Automobile....H. K. Holsman
Automobile....E. Koeb
Automobile steering device....J. Horat
Automobiles, Cushion attachment for....J. E. Marriner
Automobiles, Motor driven and steered fore carriage for....L. Krieger
Bag-fastener....C. Heiring et al
Bag-frame lock or fastener....F. J. Lau et al
Bag or purse fastener....L. B. Prahar
Bait-holder....L. R. Balken
Barium oxid, Making....C. B. Jacobs
Barrels, casks, and the like, Metal head for....A. A. Hurst
Bath-tub supply-pipe connection..W. G. Stewart
Bath-tub trap....T. S. Chew
Batteries, Negative element for primary....C. B. Schoenmehl
Battery cover and element support, 2 pats....C. B. Schoenmehl
Beading implement....G. E. Morris
Bearing, Ball-, 2 pats....R. G. Cornforth
Bearing, Roller-....W. S. Sharpneck
Bearings, Means for luhricating sleeve-....W. H. McGauley
Bed, Folding....N. C. Merrill
Beehive-forming mechanism....P. J. Fink
Belt....A. Susseles
Belt....R. B. Dwyer
Belt for power transmission....G. Magaldi
Belt-shifting mechanism....I. A. Rommer
Billet-loop....G. D. Baily
Blast or exhaust apparatus....G. Elbel
Blocks, Form for setting up and holding sectional....W. T. Huening
Bobbin-spindle....H. Wyman
Boll-weevil-catching machine....W. M. and R. J. McCurdy
Book for manifold writing..W. E. Easterbrooks
Bookbinder's strip-applying machine....C. J. Duggan
Bookbinding....W. H. Rademaekers
Boot and shoe cleaning stand....A. F. Bigford
Bottle....N. Hoffmann et al
Bottle, Non-refillable....J. F. Hedge
Bottle or jar closure....C. J. Lundquist
Bottle-packing....B. Kochs
Bowling-alley hall-stop....W. W. Vearing
Box top, Powder-....W. H. Perkins
Boxes, crates, &c., Reinforced corner for....H. M. Amos
Bracelets, Making....P. H. Long
Brake....S. E. Chidister
Brake-head, Adjustable....P. T. Handiges
Brake-lever....J. J. Byers
Brake-shoe....I. A. Gibbs
Brake-shoe shell....W. H. Thrash
Braking system, Automatic....B. Aikman
Broom-holder....C. J. Wren
Brush, Blacking-....R. T. Overton
Brush, Fountain-....H. L. Loring
Brush-holder....W. L. Waters
Buggy-top support....J. Elms
Building-block-forming machine....W. Raab
Building structure....M. A. Morton
Bundle or package tie....H. B. Ward
Burglar and fire alarm, Invisible electric....J. W. Dawson
Burial apparatus....F. Garpheide et al
Burial-casket....A. S. Seidel
Button-fastener....M. B. Ryan
Buttonhole-tape....A. Bernstein
Cabinet, Dispensing-....L. Lammer
Cable-hanger....H. W. Pleister
Calculator....J. E. Duncan
Camera, Folding photographic..F. A. Brownell
Cameras, Device for focusing photographic....W. Thorner
Can-opener....J. Zander
Cans, Packing composition for seams of....L. C. Sharp
Car construction....J. R. Cardwell
Car-coupling....C. H. Tomlinson
Car-coupling....G. P. Ritter
Car-door-operating mechanism, C. A. Lindstrôm
Car, Dump-....H. B. Earling et al
Car grain-door, Railway-....J. C. Marxen et al
Car-lighting system....W. A. Turbayne
Car-replacer....G. H. Sargent
Car-vestibule....L. Ullo
Cars, Attachment for dirt push-..J. W. Grubbs
Cars, &c., Ventilator for railway....J. E. Ward
Carbureter....T. E. Puddington
Carbureter, 2 pats....W. L. Marr
Carbureter....G. M. Schebler
Carbureter....T. E. Puddington
Carbureting mechanism for internal-combustion engines....A. R. Brush
Card-record....L. S. Bassett
Carriage, Mechanical-doll....C. H. Hood
Carriage robe, cushion, and attachment for holding toilet essentials, Combined....K. A. Weide
Cart, Fodder-....T. F. [illegible]
Cash-box....R. S. [illegible]
Cash-carrier, Pneumatic-tube....D. S. [illegible]
Cement-chair mold....M. S. [illegible]
Cementing material and making same....T. W. [illegible]
Chain....J. F. Wagner
Chair-seat-making machine....L. G. McKnight
Chart, School-room....A. E. Osborne
Check-register....D. W. Morse
Check, Sales-....G. Heinersdorf
Cheese-cutter, Computing....J. W. Isler
Cherry-pitter....A. G. Weinhardt
Choke-coil....L. O. Langworthy
Chuck, Lathe-....J. M. Jipperson
Churn....D. W. McNeel
Churn....J. Mott
Cigar-ash thimble and protector....H. S. Cunningham
Cigar-boxes, Price-marker and lid-holder for....W. I. Galentine et al
Clamping joinery-work, Means for...C. Krog
Cleaning and polishing composition..S. R. Fee
Clothes-hanger....T. M. Anderson
Clothes-pounder....J. H. Bowling
Clothes washer and drier....F. A. Dinsmore
Clutch....H. Haeberlin
Clutch....A. W. Wigglesworth
Cock, Water-....L. W. Eggleston
Coffee-roaster....E. T. Shortt
Coherer and decoherer....J. L. Jones
Coil-support....W. L. Waters
Coin-actuated mechanism....W. M. Reason
Coin-detector....F. Eckert
Coin-receptacle....B. vom Eigen
Coin-repository, 2 pats....B. vom Eigen
Coin-testing machine....M. D. Sadtler
Collapsible box....W. F. Mestemacher
Collar....G. F. McManus
Compound engine....M. H. Sullivan
Concrete-mixer....J. H. Stewart
Concrete-mixer....J. F. Crowe
Concrete-mixer....P. P. De Bogory
Condenser system, Surface....J. Stumpf
Condensing apparatus....J. Astrom
Connection-box....R. D. Holabird
Controler....G. B. Schley
Conveyer....R. C. Straight
Core-making machine....C. H. Blau et al
Core-oven....B. H. Prack
Corn and the like, Holder for....G. P. Huguet
Cornet or the like....T. C. Edwards
Cotton-picker's sled....T. A. Windsor
Course and log recorder....T. M. Foote
Crate, Laundry-....J. Eastman
Cream-separator....E. R. Bailey
Cream-separators, Liner for centrifugal....W. W. Marsh et al
Cream-separators, Liner for centrifugal....T. W. Morgan
Cuff....D. H. Anderson
Cuff-protector....M. P. Vucassovich
Cultivator....C. S. Sharp
Curtain-pole....J. Kroder
Cut-out block....F. Brunberg
Cycle handle-bars, Handle-grip for....M. C. Stokes
Damper-regulator....C. C. Koster
Derrick, Dirt-....G. Sorteberg
Desk-table....S. M. Wirts
Display-holder for jewelry and the like....M. Jersemann
Display-rack....J. B. Whitaker
Display-stand....W. Crowther
Door-holt....F. A. Tomkins
Door fixture, Sliding-....C. Metterhausen
Door holder and bumper, Combined....J. B. Hightower
Door-opener, Electric....J. Loch
Draft-equalizer....A. Hines
Draft-tube....H. A. Maxwell
Dredge....E. J. Bevan
Dredge, Siphonic....W. J. Moninghoff
Drill-bit, Fluid-feed side-inlet....J. H. Wiest
Drilling apparatus....P. Repsold
Drum, Bass....G. W. Britton
Drums, Construction of....C. Poland
Dust-guard....H. C. Lafferty
Dye and making same, Brown sulfur....M. R. Moffatt et al
Dye and making same, Green....P. Julius
Dye and making same, Red trisazo....G. Kalischer
Ear-stopple....G. B. Frank
Egg-holder....J. Csincsak
Electric battery....C. B. Schoenmehl
Electric cable....C. E. Wilson
Electric heater and rheostat....J. H. Delany
Electric furnace....E. F. Price
Electric machine, Dynamo-....W. L. Waters
Electrical connection....G. H. Jacob et al
Electrical-distribution system, 2 pats....A. S. Hubbard
Electrical-regulation system....M. Moskowitz
Electrical system of distribution....W. E. Winship
Electromagnet, 2 pats....H. Rowntree
Elevated carrier, 2 pats....W. J. Chance
Engine....F. L. Eager
Engine spark-plug, Explosion-....E. A. LaHar
Engraving-machine....R. Turner et al
Envelop....M. A. Corliss
Envelop....G. Hitzler, Jr.
Envelop and letter-sheet, Combined....I. L. Greenblat
Envelop, Return-....T. C. West
Excavator....T. P. Rochford
Explosion-motor....A. Peugeot et al
Explosive....C. E. Bichel
Explosive-engine....W. R. Harris
Explosive-engine....K. Nicoll
Expression device....F. W. Wood
Eye-testing apparatus....R. Dodge
Fan....O. Selg
Farm-gate....W. N. Mark
Fastening device....W. S. Vollmer
Faucet, Filtering-....J. Koehler
Feed-box, Vermin-exterminating....D. A. Bradford
Feed for automatic machines....F. H. Richards
Feed-water heater, Boiler....R. Kablitz
Feeder and exerciser, Poultry...W. M. Conner
Feeder, Pig-....E. B. Espy
Fence....W. H. Dillon
Fence-making device....V. Lardholm
Fence-post....W. H. Sawyer
Fence-stretcher....I. K. Hollinger
File and assembling means, Document....J. J. Nicholson
File, Bill-....E. D. Bates

File, Bin-....G. C. Odor
Files, Guide card or partition for vertical....L. Senge
Filter elements, Lining for....C. Sellenscheidt
Filter-plate....H. M. Ashby
Finger-spreading apparatus....R. Finger
Fire-alarm, Automatic....W. T. Munro
Fire-curtain....A. M. Fuller
Fire-extinguishing receptacles, Cover for....J. F. MacWilliam
Fire-hose bridge....R. C. Groh
Fire-pail, Chemical....J. G. Mastin
Fish-hook....E. L. Gilmore
Fish-screen....J. R. Grant
Fishing-line-drying reel....C. L. Fowle
Floor-dresing machine....A. L. Blodgett
Flue-scraper....E. F. Fletcher
Flushing-tank....E. J. Wackerle
Flushing-tank and closet....J. O. Bree
Folding box....F. P. Hulett
Forceps, Animal-....F. M. Rowe et al
Forge, Blacksmith's....H. P. Dorsheimer
Form, Garment-....H. Frankel
Form or display-rack for shirt-waists and similar garments, Bust-....M. Litt
Frame....J. Mueller
Frictional brake....W. Love
Fruit and flower picker....J. B. Tuttle
Furnace-wall....K. C. Hoxie
Furnaces, Air-feeding grate for....J. O. Schmidt
Fuse, Mechanical time-....K. Wieser
Gage and signal device, Combined....M. G. Melvin
Game apparatus....T. A. Randall
Game apparatus....G. S. Parker
Garment attachment....H. Thompson et al
Garment, Child's....F. H. Sprague
Garment-clasp....J. Lemay
Garment-hook and hat-holder....M. S. Gorman
Garment-supporter....D. Blacklund
Garment-supporter attachment....A. H. Sawtell
Gas-burner controlling mechanism....F. Cais
Gas-burner, Incandescent....R. Busquet et al
Gas-generating apparatus....A. L. Blaesy
Gas, Generating power-....H. G. Boyd et al
Gas generator, Acetylene-....J. Heaton
Gas-keys, Safety-cap for....E. J. Cherrington
Gas-light fixture....J. Maas
Gas-lighter, Automatic....E. Zickwolff
Gas-pressure gage....W. Thomas
Gas-producer....J. R. George
Gas-producer feeding mechanism....V. E. Edwards
Gas-producers, Fuel-feeding mechanism for....D. Baker
Gas-producers, Poker mechanism for....S. B. Sheldon
Gases, Apparatus for producing electric discharges through....A. Schneller
Gate....W. B. Morgan
Gate....J. W. Robinson
Gear casing, Transmission-....A. Tedeschi
Gear, Change-speed....P. Hesselius
Gear for cycles and the like, Gradually-variable speed-....F. H. De Veulle
Gear, Variable-speed....W. Wolter
Gearing, Machine for cutting toothed....G. Nardin
Gearing, Speed-change....E. J. McClellan
Glass articles, Apparatus for drawing hollow....J. H. Lubbers
Glass, Ornamenting...J. M. Conroy (Reissue)
Glassware-finishing, Automatic snap for....J. E. Crawford
Grader, Road-....J. T. Haynes et al
Graft-wrapping machine....W. H. Bell
Grain-cover....A. S. Butner
Grain-heater....M. Klements et al
Grain-treating apparatus....C. D. Stephens
Grate....J. W. Wilcott
Grate, Movable....A. B. Reck
Grinding machine, Cutlery-....W. J. Bastian et al
Grindstone for grinding or smoothing lithographic stones....O. Reuchlin
Gums of certain sapotaceæ, Substance produced from the....M. M. Dessau
Gun....J. Becker
Gun-sight....J. Y. Bassell et al
Gun with recuperator-spring, Recoil-....H. Kanonenberg
Gun with screw elevating mechanism and adjustable sight device....O. Grauhering
Guns, Apparatus for adjusting elevation of....G. A. Schoeller
Guns, Breech-closing device for....A. Bobbert et al
Guns, Fluid-brake for recoil-....O. Lauber et al
Guns, Pneumatic recuperator for recoil-....O. Lauber et al
Harness....W. B. Hilton
Harvester....G. W. Ingersoll
Hay gatherer and stacker....E. M. Orton
Hay-press....E. W. Kelsey
Hay-rack standard....B. C. Speer
Hay-racks, Load-binder for....C. H. Cline
Heat-coil and protector unit....W. Kaisling
Heating and ventilating system...J. E. Moore
Heating, Art of....E. H. Gold
Hectograph composition....W. Doctor
Heel-locking device, Adjustable-...C. S. Shute
Hides for the manufacture of leather, Preparation of....O. Röhm
Hinge-seat-cutting tool....G. M. White
Hinge, Spring-....F. Brucker
Hitching-block, Portable....J. B. Barnett
Hog-hoist....G. Schmidt et al
Holder, Combination-....F. Haase
Horse-blankets, lap-robes, &c., Safety attachment for....J. E. Hunter
Horseshoe....J. G. Burns
Horseshoe, Nailless....W. Dettmann
Hydrocarbon engine....J. W. Packard et al
Injector....W. R. Park
Ink-well....J. C. Pyers
Inkstand....B. O. Roberts
Insecticide....M. Bean
Internal-combustion engine....J. B. Knickerbocker
Internal-combustion engine....J. Sulzer
Iron, Treating....P. Wilkes
Ironing-board....F. R. Fiebke
Jar-closure....F. W. Bedford
Jarcover-fastening, Fruit....W. A. Bostwick
Key-action....J. C. Wahl
Kitchen-rack....O. Rothengatter
Knife cleaning and polishing machine....H. F. Hambruch
Knife-handle....W. W. Howell
Knit fabric and making same....R. J. Steiner
Lace fastener, Shoe-....R. Gayton
Ladder....R. R. Jones
Ladder, Extension step-....A. C. Taylor
Lamp....E. P. White et al
Lamp, Electric incandescent....H. Kuzel
Lamp, Miner's....S. J. Thompson
Lamp, Vapor electric....R. Küch
Lantern....W. S. Hamm
Latch mechanism, Door-....A. R. Pool et al
Lathe....P. Murray
Lens-grinding machine, Toric-...C. F. Wall et al
Lenses, Manufacturing bifocal....J. L. Borsch, Jr.
Leveling-staff....W. F. Darling
Lifting-jack....C. Collier et al
Limekiln....R. H. Moler
Linotype-machine, 4 pats....A. Dow
Linotype-machine....W. H. Scharf
Linotype-machine matrix....A. Dow
Linotype-machine spacer or justifier...A. Dow
Liquid-applying instrument....J. A. Boyajean et al
Liquid-holder, Dispensing....H. P. Gorman
Loading apparatus....P. Bissen
Loading apparatus....N. Madson
Loading apparatus for wagons and the like....L. Kniffen
Log-turner....S. D. Arthur
Loom, Automatic filling-replenishing....U. Hebert
Loom picker-check....A. S. Cowan
Loom warp stop-motion....J. B. Derfinak
Looms, Automatic weft-replenishing apparatus for....J. Rostron et al
Looms, Reversing mechanism for the take-up mechanism of....E. H. Ryon
Lubricator....C. B. and F. W. Hodges
Mail-bag catcher and deliverer....G. J. Meier
Mail-bag catching and delivering apparatus....J. C. Dayton
Mail-delivery apparatus....A. K. Landis
Mailing device....J. R. McLellan
Map-holder....A. J. Nystrom
Marking device....R. L. Herman
Massaging device....K. C. Jopling
Match-box and other receptacle...B. vom Eigen
Measure, Tape-....S. D. Jordan
Measuring the refraction of the eye, Lens system for....H. L. De Zeng
Mechanical movement....H. Brammer
Metal cutting and shaping machine....J. R. Main
Metal-drawing apparatus....J. T., S., and W. Moltrup
Metal-heating furnace....J. R. George
Metal wheel....W. E. Williams et al
Metal-working machine....S. Zietarski
Metals, Electrotypic process of producing....E. F. Price et al
Metals, Extracting....D. R. Robertson
Metallic fender and mud-guard....W. C. Groehn
Metallic tie and rail fastener....L. McFarland
Micrometer-gage....C. A. Kelley
Millstone-dressing machine....R. C. Helms
Mining-dredge....T. P. Rochford
Mirror attachment for table implements....E. Walter
Mixing-machine....C. W. Upwright
Molding-machine....J. P. and J. F. J. Costigan
Motors, Fuel-sprayer for internal-combustion....H. A. Johnston
Music-sheets, Machine for making perforated....F. L. Wood
Music turner and holder, Automatic sheet-....H. F. Shipley
Musical instruments, Pedal mechanism for....A. F. Larson
Musical key instruments, Playing attachment for....A. T. Chester
Nail....W. Horner
Nails, Machine for making roofing-....J. E. Dobson et al
Necktie-support....N. D. Nelson
Needle-threader....A. P. Koon
Nut-lock....J. W. Shawver
Nut-lock....R. H. Fisher
Oil-burning plants, System of regulation for....J. R. Atchison et al
Oil-treating apparatus, Waste-....P. E. Moock
Oils, Apparatus for treating waste....H. E. Haller
Oiling device, Valve-....B. Aikman
Ophthalmoscope....H. L. De Zeng
Ordnance-sighting apparatus....K. Völler
Ore-crusher....C. O. Michaelsen
Ore previous to cyaniding or the like, Means for treating crushed....H. L. Templer
Ores, Balling together of purverulent or dusty....H. Dicke
Overflow alarm....A. W. Andersen et al
Package-tie....W. E. Fricke
Package-tie....P. L. Wilkerson
Packing-case wall....G. F. Bishopric
Pants and drawers supporter....W. F. Craig
Paper-board container....J. W. Low
Paper-board, Machine for making combination....O. H. Moore
Paper-feed mechanism....F. L. Wood
Pattern....G. M. Laub
Peanut-gleaner....H. L. Pippen
Penholder....W. A. Caldwell
Perambulator....V. Baur
Photographic and other purposes, Manufacture of films for....J. H. Smith
Photographic film for daylight loading....G. Bianchi
Photoghaphic objective....P. Rudolph
Photographic ray-filter....P. J. Dukelow
Piano action, Upright-....M. Beckwith
Piano, Autopneumatic music-playing....F. C. White
Piano or ogran players, Governing mechanism for pneumatic....J. H. Chase
Picture and producing the same, Multiple....G. Holmsten
Picture apparatus, Life-motion-....J. Bianchi
Picture-supporter....E. F. Bradt
Pictures, Machine for making and displaying....W. N. Selig
Pigment, 2 pats....J. C. Heckman
Pin....F. J. Kristofek
Pipe nipple-holder....J. Yule
Pistons, Cushioning device for....O. S. Pike
Plaiting and braiding machines, Switch for....B. Lepperhoff
Planing-machine....J. R. Thomas
Planter....C. B. Roziar
Planters, Covering attachment for seed-....E. Taylor
Plastering material....D. R. Jones
Plow....G. Ross
Plug-driver....C. E. Glidden
Pocket safety attachment....H. Erickson
Powder can or box, Sifter-top....J. M. Hothersall
Powder-distributer....C. D. Holt
Power-motor....W. Snee
Power-transmitting mechanism...R. H. Dunlap
Pressure-controller....A. Michelin
Printing and other purposes, Cylinder for....W. Love
Printing machine, Two-color-....T. Brock
Printing-press....C. G. Harris et al
Printing, ruling, and like machines, Feeding mechanism of....F. W. Vickery
Propeller, Fish-tail....F. S. Merrow
Propulsion of vessels....G. Pertot
Protractor....J. A. Grenier
Pulley....W. Mayer
Pulverizer....J. N. Lewis et al
Pump....H. G. Riebenack
Pump....J. W. Anderson
Pump, Air-....O. J. Darling
Pump, Automatic hydraulic....L. A. Laursen
Pump, Duplex air-....J. Shourek
Pump for pumping liquids, Steam-....J. K. Sweeny
Pumping apparatus; Wave-power....F. E. Bosworth
Punching-machine....W. T. Sears
Pursc-puzzle....T. P. Reid
Puzzle....D. D. Lowery
Rack....J. Boyle
Radiator....J. T. Stokes
Radiator attachment....J. M. Dungan
Rail....E. R. Robinson
Rail-joint....J. C. Hafford
Railway, Amusement-....J. H. Dewey
Railway block-signal....D. H. Coker et al
Railway cattle-guard....J. H. Brown et al
Railway-frog....G. H. Trisch
Railway-gate....W. H. Karn
Railway-gate, Electric....R. M. McGee
Railway-rails, Manufacture of...W. H. Connell
Railway road-crossing, Metal....R. Faries
Railway-signal, Automatic....J. P. Norwood
Railway-signal, Electric....A. Kuzel
Railway signaling apparatus, Electric....P. J. Matter
Railway-switch, Automatic....I. A. Call
Railways, Automatic electric signal system for....J. P. Buchanan
Rake....W. C. Rarig
Rake....B. H. Ellis
Rake-cleaner....J. E. Lucas
Ratchet-wrench, Socket....W. A. Burnop
Razor....M. Schültze
Reamer....C. L. Martin
Receptacle-closure....F. Lalau
Receptacle-closure, Detachable....H. P. McMillan
Refrigerator overflow-tanks, Alarm device for....H. T. Dumas
Relay for signaling apparatus..L. H. Thullen
Retinoscope, ophthalmoscope, and the like....C. C. Inskeep et al
Rock-drill, Hydrocarbon-....J. V. Rice, Jr.
Rolls or drums, Means for attaching flexible material to....T. H. Davies
Rotary engine....W. J. Chance
Rotary engine....T. Ashley
Rotary explosive-engine....S. L. Robbins
Rotary rake, Side delivery....J. Dain
Rotary screen....D. P. Findley
Sad-iron....N. R. Streeter
Saddle....J. Wittner
Salt-trough....A. R. Hoffmann
Sample-holder....I. J. Kornik
Sander, Automatic....H. M. Williams et al
Sap-collector....J. F. O'Connor
Sash-weight....F. C. Schwedtman
Saw gage and jointer....J. H. Wheelock et al
Scale, Computing-....J. J. Duffie
Score-board....J. M. Hamilton
Sealing cap, Bottle-....E. D. Betts et al
Seaming and corrugating pipes, Machine for....J. J. Heggy
Section-press and foundation-setting mechanism....C. E. Cox
Self-closing lock....A. Nathan
Sewer-trap....F. A. Radcliffe
Sewing-machine angle-sewing attachment....W. Wilson
Sewing-machine binding attachment....W. Wilson
Sewing machine, Button-....B. T. Leveque
Sewing-machine shuttle....C. F. and M. T. Goforth
Sewing-machine take-up....W. M. Ammerman
Shade-fixture, Window-....A. L. Crim
Shade-roller....E. E. Palmer
Shaft-bending machine....P. P. Dyke
Shifting device....E. C. Smith
Shingle for roofs and gable ends of houses, Composition....C. W. Young et al
Shipping and display box....F. G. Merritt
Shirt....G. G. Rockwood
Shirt holder, Laundried-, 2 pats....N. J. Goodman
Shock-absorber....G. L. Harvey
Shoe....P. G. Mayhew
Shoe....J. M. Quin
Shoe-fastening....W. A. Dunstan
Shoe-finishing machine....J. S. Hansen
Shutter-operator....R. C. Spencer, Jr.,
Sifter, Ash-....G. W. Child
Sifter-top can or box, Sheet-meetal....J. M. Hothersall
Sight-feed lubricator....F. W. Edwards
Signaling system....J. Shepherd
Silicon dioxid, Making....H. N. Potter
Silicon monoxid, Making....H. N. Potter
Sleigh-runner, Detachable....B. White
Slimes treatment....C. E. D. Usher
Smoke and soot arrester for stacks....J. F. Miles
Snap-fatstener....G. A. Holmes
Soap-anchor....G. W. Gaines
Sod cutting and removing device....J. A. Musgrove, Jr.
Soda-fountain, 2 pats....H. K. Smith
Sodium formaldehvde sulfoxylate....B. R. Seifert et al
Soldering machine, Can-vent-...C. A. Crandall
Sole, Cushion shoe-....E. E. Harmon
Speculum, Mouth-....N. W. Kyle
Spindle....C. S. Foster
Spoke-socket....N. W. May
Spring-bridge....G. A. Bader
Sprocket, Friction-....E. F. Hafelfinger
Square, Bevel-....M. Renner
Stakes, Attaching means for....J. A. Toomey
Stamp, Ore-....W. B. Easton
Steam-generator junction-box....J. C. Parker
Steering-gear....A. P. Brush
Stenciling-machine....E. F. Kunath
Stirrup....W. D. Miller
Stitching machine, Thread-laying device for book-....F. Kugler
Stove and furnace....W. R. Fenerty
Stovepipe, Extension-....H. K. Hansen
Street-sweeper....C. O. Smith
Street-sweeper....E. E. Hall
Sulfur-burner....J. F. Conrad
Sulkies and gang-plows, Attachment for....J. T. Toland
Swing....W. T. Green
Swing....M. Hathaway
Swing, Lawn-....W. S. Tothill
Syrup-dispensing apparatus..J. McCloskey et al
Table-top, Removable....N. C. Merrill
Target-trap....H. E. Winans
Telegraph, Duplex....J. J. Ghegan
Telegraph instrument....B. F. Bellows et al
Telegraph, Printing....J. C. Barclay
Telegraph-transmitter, Automatic....J. C. Barclay
Telephone local toll or pay stations, System and apparatus for....J. Harrison
Telephone selector and lock-out, Party-line....H. D. Williams
Telephone service, System for measured....J. Harrison
Telephone toll-box....J. Harrison
Telescope....E. Neumayer
Telescope, Binocular....R. Straubel
Telescope, Double....R. Straubel et al
Telescope, Sighting-....M. da S. Netto
Telescope, Sighting-....F. Schleth
Tent....F. W. Burch
Thill-coupling....C. C. Bradley
Thread-guide mechanism....J. E. Prest
Threshing-machine....F. F. Landis
Threshing-machine....J. Sanders
Threshing-machine....A. M. Anderson et al
Ticket issuing and recording machine....H. Tyler
Ticket separating and counting machine....W. A. Gibbs
Time-indicating device....G. E. Getz
Time-recorder, Workman's....W. A. Wood
Tires, Means for attaching pneumatic....A. C. Miller
Tongs, Crushing-....M. B. Pickett
Tool, Combination-....J. M. Kiehle
Tool, Electric-driven....A. F. Carver
Tool-operating machine....G. P. Thomas
Top-holder....M. Glasscock
Towel rack and holder, Combined....O. E. Myers
Toy....W. Hizer
Traction-wheel, Motor-vehicle...C. H. Schmidt
Train-controller, Automatic....G. Toft
Transporting system....H. G. Brown
Transmission mechanism....L. E. Mahout
Tray or truck, Portable....A. C. McNiven
Trench-brace....M. R. De France et al
Trolley....J. Shepherd
Trolley-guard....J. E. Saucier
Trolley-harp....H. W. Kimes
Trolley-line clamp....A Caron
Trousers-holder....E. Rohde
Truck, Log-....J. W. Germany
Truss....J. Habenicht
Tubes, Automatic shut-off for pneumatic....E. Flint
Turbine....A. Jude
Twine or cord hanger....H. Allers
Twisting-Machine....P. Hardman
Type-setting and line-casting machines, Spacer for....H. Degener
Type-writer ribbon attachment....C. A. Joerissen
Type-writers and the like, Copy-holder for....W. L. Wood
Type-writing machine....C. A. Morey
Type-writing machine....J. Völker
Type-writing machine....F. A. Young
Type-writing machine....B. C. Stickney
Type-writing machine....A. T. Brown
Type-writing-machine line spacer, 2 pats....J. S. Southerden
Umbrella....T. A. Stombaugh
Umbrella, Folding....G. C. Shivers
Umbrella, Folding....N. Spanick
Unloading and transferring apparatus....G. M. Bennett
Valve....W. Platz
Valve-actuating mechanism...W. D. Sweetman
Valve, Combined wet and dry pipe....A. S. Nicol
Valve for air-brakes, Quick-action triple....W. T. Richards
Valve for steam-boilers, Safety-...E. J. Clarke
Valve, Hydraulic....C. E. Gillette
Valve-lifter....D. Rohen et al
Valve, Puppet-....J. H. Dickinson
Valve, Relief-....J. L. Doherty
Vault lock, Grave-....J. E. Myers et al
Vehicle-brake....D. T. Lohnes
Vehicle canopy-top....J. H. Sprague
Vehicle, Motor-....W. L. Marr
Vehicle shock-absorbing apparatus....R. M. Lovejoy
Vehicle shock-weakening device....H. Sans
Vehicle-spring....F. R. Skidmore
Vehicle-spring....A. Fortner
Ventilator....G. Kabureck
Vessel Transport....O. Mehrtens
Veterinary obstetrical instrument....G. Gabel
Veterinary operating-table....I. L. Smith
Veterinary remedy....C. A. Coe, Jr
Vibrator....E. M. Tormin
Wagon-dumps, Automatic controller for....L. J. McMillin
Wagon or truck....A. Smith
Wall-register....C. J. Andrae
Wall-tie....J. Schirra et al
Walls, Manufacture of intermediate....H. Hansen
Washboard....G. B. Lutomski
Washing-machine....C. Vieman
Washing-machine....A. T. Newman
Washing-machine gearing....A. F. Victor
Watch-barrel....W. B. Mehl
Water-governor, Centrifugal....W. L. Waters
Water-motor....R. D. Tittle
Water-tank, Cement....J. J. Daniel

Weather-strip....A. S. Aiman
Weather-strip....A. R. Thomas
Weeder and cultivator....O. J. Gonzalez
Well-drill....H. B. King
Well-pulling machine....O. D. Kraft et al
Wheel-flange pressures, Apparatus for testing....G. L. Fowler
Wind-strip....J. S. Sewell
Winding machines, Manufacture of paper cones for yarn....W. F. Smith
Window....M. Leevin
Window-lock....W. E. Poulson
Window-operating mechanism....C. P. Pond
Window-rest and escape-ladder, Combined....J. J. Hersche
Window-ventilator....J. L. Mallory
Wire-stretcher....C. C. Atkinson
Wire-tie....H. A. Drew
Wrench....H. A. Sturges
Wrench....J. E. Wakefield
Wrench....H. C. Moore
Writing-machine....W. A. Schmidt

DESIGNS

Bottle....F. U. Bowers
Collar, Shirt....D. R. Griffith
Jar....D. R. Brown
Oil-cloth....A. Hunsicker
Paper, Decorative....C. L. Mead
Shade or globe for artifical lights....G. F. Wehr

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MECHANICAL PATENTS.

Abdominal supporter and truss....B. F. Lacy
Acid, Concentrating nitric....H. Pauling
Advertising device....E. H. Lawton
Agricultural implements, Riding attachment for....N. H. Bloom
Agricultural implements, Steering mechanism for....M. Goodfellow
Air-compressor....F. B. Babbe
Air inlet, Fresh....J. L. Fruin et al
Alloying tungsten, molybdenum, &c, with iron and steel....P. Kemery
Amalgamating apparatus....F. D. Fenn
Amalgamator....F. B. Sanford
Amusement device....E. M. Fraser
Animal-catcher....S. A. Buxton
Animal-trap....H. L. Mainland
Arcs, Apparatus for producing voltaic high-current....H. Pauling
Armature-winding machine....C. H. Lewis
Asparagus-cutter....C. F. Davis
Assay-furnace....L. Baudendistle
Assembler, Automatic....W. L. Ainslie
Autographic register....W. Maass
Autmobiles and other vehicles, Air-cushion and air-compressor for....W. H. Nelson et al
Automobiles, Dust-removing and exhaust device for....P. N. Ramsey
Automohiles, Transmission-gearing for....E. G. Hoffmann
Axle, Self-lubricating vehicle....B. F. Willett
Baling-press....D. Hendershot
Balloon, Dirigible....R. Thayer
Bank, Savings....H. Sellin
Barrels for reuse, Preparing charred whiskey....E. Bradley
Bars, Centering and gaging instrument for....T. A. Hearson
Basket....C. E. Miller
Bearing....M. John
Bearing, Ball....W. Nice, Jr
Bearing, Ball....J. L. Straub
Bed, Collapsible couch....J. Kiewicz
Bed-spring....J. McPherson
Bedstead crib attachment....W. G. Schnee
Bellows....E. Paro
Belt pin and clasp, Combined....E. C. Fisher
Belts, Cross-stay for....J. A. Wangsness
Beveling-machine....E. H. Slick
Binder attachment....J. E. Robb
Binder, Loose-leaf....A. E. Chatterson
Bit-brace handle....S. H. Stearns
Blind-operating device, Window....D. F. Lonergan
Blocker, Double....A. J. Morse
Blower, Blacksmith's....E. Remington
Blowpipe, Metal-cutting....C. Delcampe
Bohbin....B. Gause
Body loop or hanger....C. Druck
Boiler-furnace....P. Swanger
Book, &c., Scrap....M. Willinger
Bottle....F. N. Fisher
Bottle, Siphon....M. Levin
Bottle-stopper....W. B. Reilly
Bottle-stopper....L. S. Flatau
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(Continued in July Number.)

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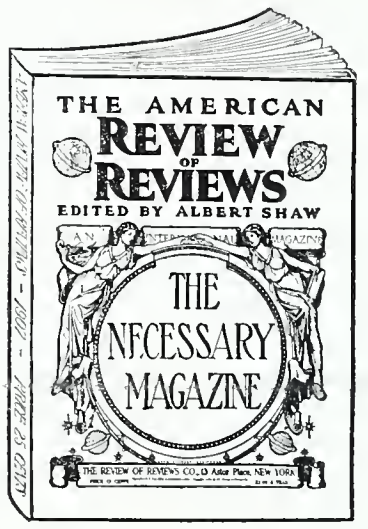
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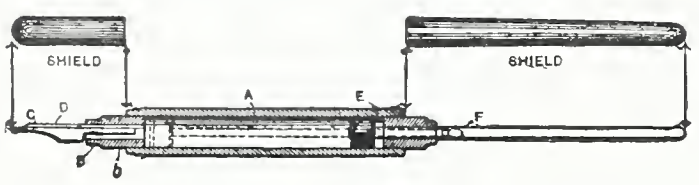
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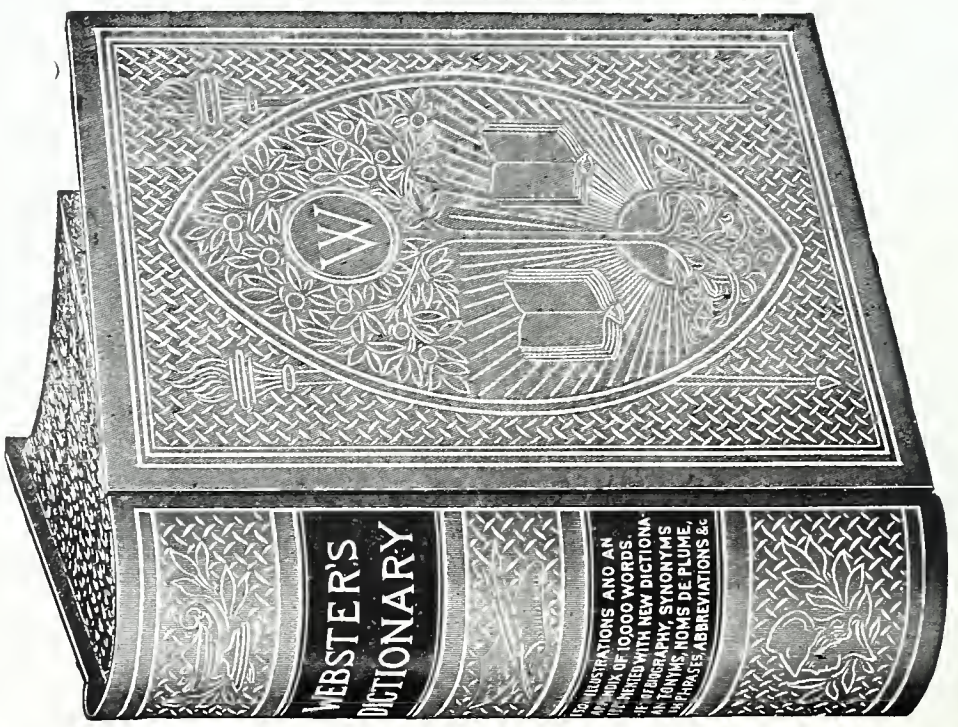


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ELECTRIC TRACTION IN THE SIMPLON TUNNEL.

By E. OMMELANGE.

THE advance in the use of electric motors for railway traction, which is so prominent a feature in the service in this country, is being paralleled in Europe. The latest is the news that trains are being hauled through the Simplon tunnel by this agency. It is now considered impracticable to use steam power in tunnels of any size, on account of the smoke and cinders; and of all tunnels in the world the Simplon would seem most to require the elimination of these disagreeable features, on account of its length. Twelve and a half miles without a break means difficulties of ventilation under the best conditions, without artificial drawbacks. Soon after the tunnel was opened, in fact, it was found impossible to operate trains in it with steam. The blast from the exhaust loosened the roof, and never a trip was made without the smashing of the glass on the weather-board by stones thus discharged. The smoke and steam, also, caused so dense a fog to form at the southern end of the tunnel that the signal light was invisible at any greater distance than 60 yards.

Arrangements for electric traction were therefore made in December, 1905, the enterprise being undertaken by a Swiss firm, which contracted to put up the requisite plant at its own risk and to operate the trains with three-phase electric motors. The conditions, from the contractors' standpoint, were of a somewhat onerous character, as the Swiss Federal Railway authorities reserved the right to abandon the system at the end of a year, if no very good results were obtained; and further the contracting firm was required to have the plant ready for operating the trains by June 1, 1907—a rather short time.

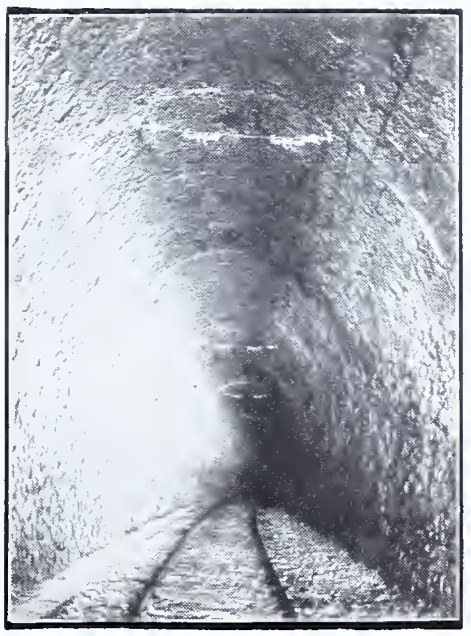


FIG. 1.—INSIDE THE TUNNEL.

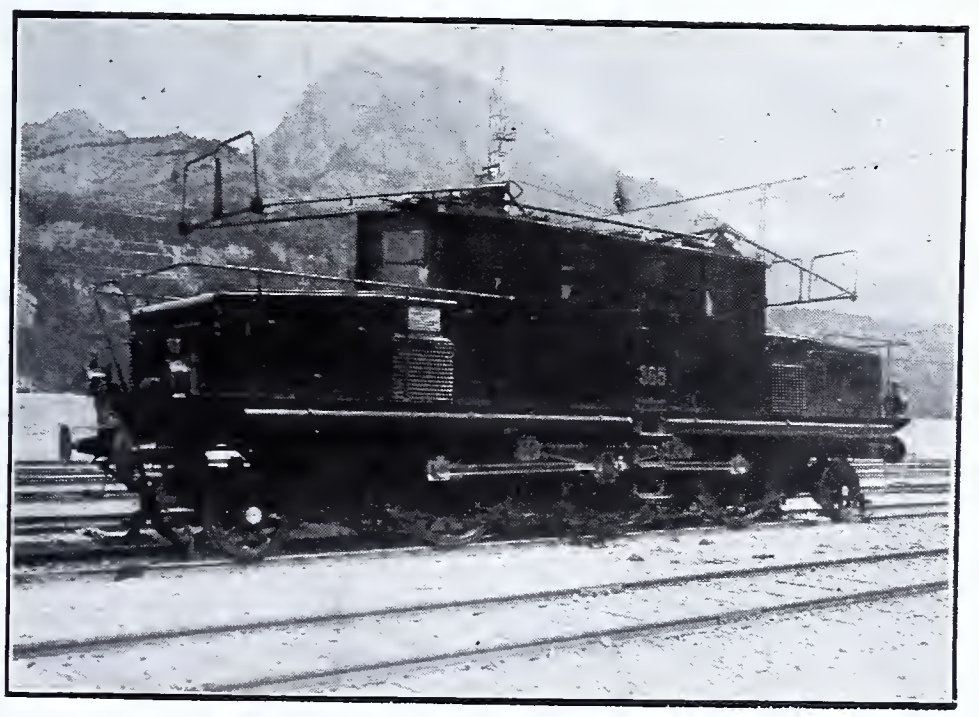


FIG. 2.—ELECTRIC LOCOMOTIVE: THREE-PHASE SYSTEM.

The work to be done in the tunnel itself consisted in erecting the overhead gear and in bonding the rails. The bond used was the Brown "plastic bond," and it was necessary, accordingly, to clean with the sand blast the surfaces of the rails and fish-plates at every joint. For this purpose, a trolley was rigged up, fitted with a petrol motor, air-compressor, and sand-tank, which was run into the tunnel daily to the point where the work was in progress. The whole of the task of equipping the line was accomplished by a staff of 80 workmen superintended by three engineers.

The tunnel being not only very hot but also very damp, the insulation of the trolley-lines required serious consideration. The plan followed was to combine in series a porcelain insulator and one of rubber, each designed to be safe against a tension of 18,000 volts when clean and dry. The trolley-wire is suspended from, and insulated by, fibre from a gun-metal cross-bar, the ends of which screw into the bell of a porcelain insulator at each end, being separated from actual contact with the porcelain by a layer of hemp. The porcelain insulators, in their turn, screw into gun-metal cap pieces, being insulated therefrom by a layer of rubber which provides a certain elasticity for the joint, and thus reduces the chance of fracture of the porcelain. The cap pieces are clamped to the suspension wire, and these suspension wires are, in turn, insulated by porcelain from the tunnel wall or from the standards used elsewhere.



FIG. 3.—ELECTRIC TRAIN ENTERING THE TUNNEL AT BRIGUE.

The view taken inside the tunnel (Fig. 1.) shows the span wires running along the axis of the tunnel, 80 feet apart on straight sections, and half this distance on curves. Further, each

trolley-wire, as can be seen, is double, this plan being adopted to facilitate the work of erection by calling for the handling of lighter wires. The system of insulation adopted has proved quite satisfactory in working. On the approaches from Brique (Swiss side) at one end, and Iselle (Italian side) at the other, single wires are used, and the span between the supports is 108 feet. These supports are made entirely of 1¾ inch gas pipe. Transverse stability is ensured by constructing one end as a tripod braced together by cross-bars, (Fig. 4.) whilst longitudinal stiffness is secured by two tubes splayed out.

As the period set for completion of the work was very short, it was thought better to make use of existing sources of power supply, wherever possible. Therefore the two water-

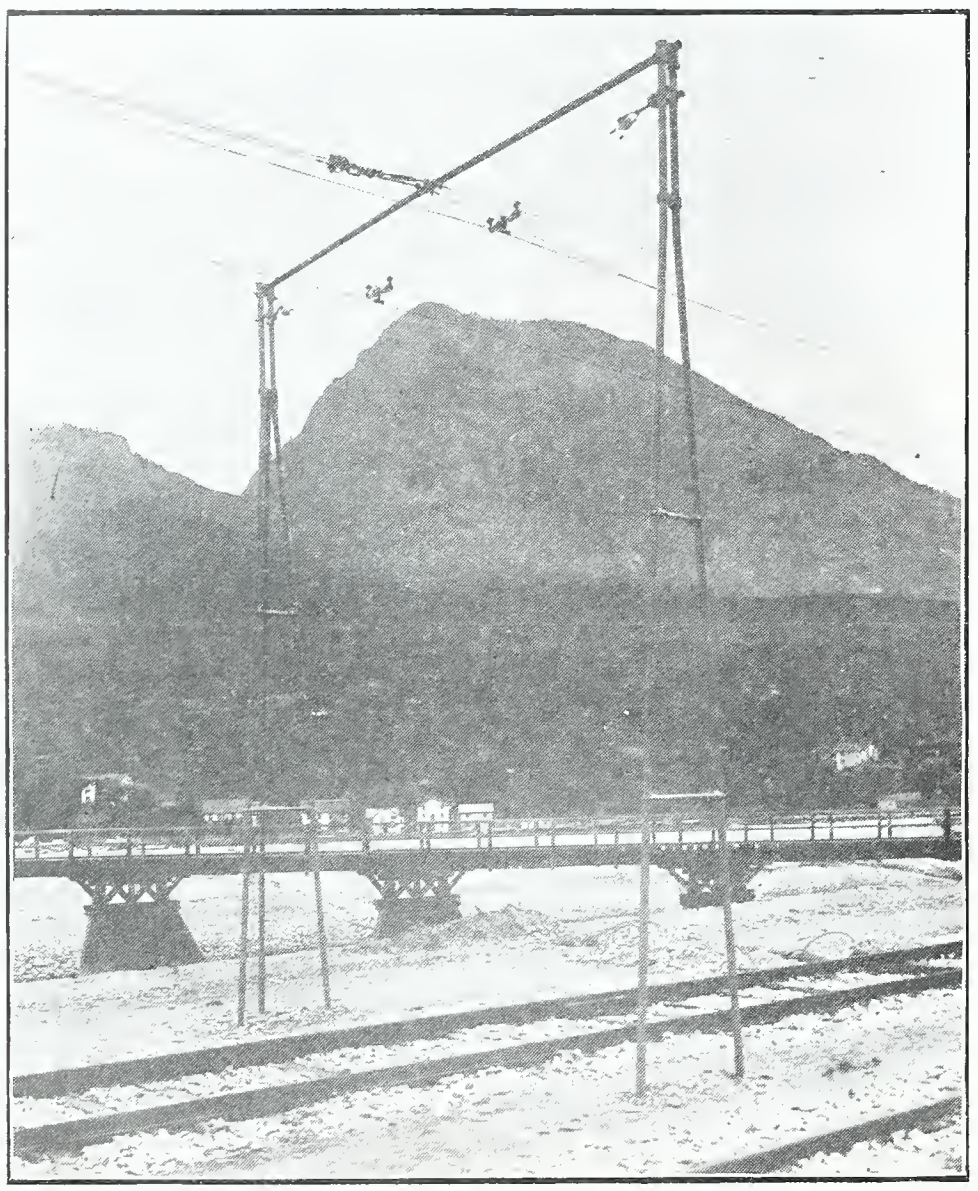


FIG. 4.—TROLLEY SUPPORTS.

power stations of Brigue and Iselle, which had supplied power for the many machines used in boring the tunnel, were somewhat modified, and converted into temporary generating stations. The current is generated here at a pressure of 3,300 volts and a periodicity of 16 cycles. This is suited for direct supply to the motors without the aid of intermediate transformers. The whole line is divided into five sections. Section switches are provided at Brigue, at Iselle, and at the station in the middle of the tunnel, and telephonic cummunication is provided for transmitting orders to the operating staff in charge of the switches.

The Italian Government specified that the passenger locomotives should be designed to work with the three-phase current supplied at 3000 volts between the phases, and with a periodicity of 15 cycles per second. The engine was to be capable of running at two standard speeds, one from 19 to 25 miles per hour, and the other double this. At the lower speed it was required to exert traction of 6 tons, and at the higher, one of 3½ tons, as measured at the draw-bar. A train weighing 400 tons, locomotive included, was further required to be started up a slope of 1 in 1000, and the standard speed of 19 miles per hour attained in less than 55 seconds. With a lighter train of 250 tons, inclusive of locomotive, a speed of 40 miles per hour was attained on a similar gradient in 110 seconds, and these conditions were to be fulfilled if the voltage should fall to 2700 volts. Further, it was prescribed that the motors should be capable of withstanding for 200 seconds an overload of 100 per cent, and during an hour's test an overload of 50 per cent, without a temperature rise of more than 40 degrees Cent. above the surrounding air. The insulation between the windings and framing was to be capable of withstanding the application of an alternating potential difference of 10,000 volts. and the insulation of the other electrical portions to be capable of withstanding a voltage of five times the designed working pressure. It was further provided that the wheels should be driven without gearing.

With two of these locomotives, regular operation commenced on June 1. In the beginning, some unexpected difficulties declared themselves, the most serious being a failure of the insulation due to the extreme moisture and heat of the atmosphere of the tunnel. The ventilation is from north to south, and at the southern end the thermometer stands regularly at 92 degrees Fahr., and the air is absolutely saturated with moisture. On renewing the insulations of the locomotives, the air-ducts were closed, and so this inconvenience was overcome.

The facilities for making measurements with electric motors have led to some interesting observations on the increase of train resistance on passing through a tunnel. It appears that about 400 horse-power more is required to haul a train at 44 miles per hour through a tunnel that would suffice for it in the open. It was further found that on the 7 per 1000 gradient from the summit to the Iselle portal, the motor would not run down by gravity if alone, but would with a train behind it. The speed, however, never exceeds 33 miles per hour under these conditions, so that the extra resistance of the tunnel as compared with open track, is apparently about 15 lbs. per ton; and this although the ventilation is in the direction of the motion. The resistance to motion in the reverse direction is greater, but not materially so.

Plants Need Breath.

Officials of the Department of Agriculture are much interested in experiments that have been recently made with the view of bringing out certain facts as to the circulation of air in the soil. It appears that considerable oxygen is absorbed by the roots of plants, and that the supply of this oxygen is maintained by air penetrating through the minute interstices of the soil. When the ground is covered with water, or when the molecules or grains of soil are dissolved in water and packed into an impermeable mass, air cannot circulate below the surface and vegetation stifles.

The experiments referred to show that lime or salt in the soil solidifies the earthy molecules and prevents their being dissolved and packed by the action of the water: hence the importance of lime in keeping the ground open, and permeable for the circulation of both air and rainwater.

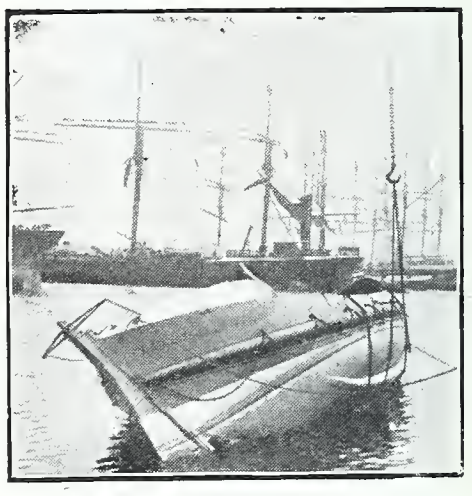
Mitigating Fogs.

A recent number of the London *Times* contains some interesting suggestions by Sir Oliver Lodge, in regard to the prevention of fogs. As everyone knows, these are generally due, in cities, to gases in the atmosphere caused by the combustion of coal. The real remedy, the author says, is not to permit coal to be brought into the city, but to have it converted into gas outside, and force the latter along immense mains to the source of consumption, just as water is now supplied. It would then be possible to dispense with the conveyance of fuel in the solid form; and the gas could be made in such a way as to economize the valuable products of distillation.

UNSINKABLE LIFEBOATS.

By E. OMMELANGE.

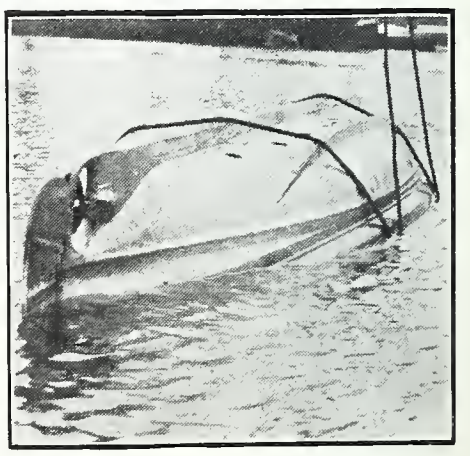
The saving of human life is a subject we never tire of, and recent trials of unsinkable lifeboats in England have been followed with general interest. The National Lifeboat Institution has been experimenting with internal combustion engines; a type possessing considerable advantages over the steam engine for this class of work, the most important of which are the smaller space for the same horse-power, the ability to start up at once without delay to raise steam, and the fact that the motor can be so placed amidship as to admit of the use of oars without inconvenience.



THE BOAT IN INCLINED POSITION BEFORE CAPSIZING.

The latest test was made by the installation of a Thornycroft 4-cylinder, 24 horse-power motor in a lifeboat, and the trials were carried out on the Thames. The average speed attained with all equipment on board and ballast to the weight of a full crew, was 7.3 knots.

There were also capsizing trials, (see illustrations) to determine whether the engine casing was perfectly water-tight, and whether the motor would, as required, stop automatically when the boat was keel uppermost. If the propeller continued to revolve when the lifeboat was capsized, it would be liable to injure anyone coming in contact with it, foul the ropes, etc.



THE BOAT CAPSIZED.

The boat was completely capsized twice, and each time the motor stopped when the boat was in an inclined position.

The engine casing proved to be absolutely water-tight, which shows good workmanship and design, as all control rods, pipes, etc., have to pass through water-tight glands.

Getting Fertilizer from the Air.

The world's demand for nitrogen is large and is rapidly increasing, not only for agricultural but for industrial purposes. In view of the diminishing supply, it is a matter of general interest to learn that a method has been devised for extracting nitrogen from the air by the use of electricity. One of our consuls in Norway describes this process, which is practiced on a large scale in that country.

The method, he says, is a new way of utilizing electricity, although it is a succession of the experiments made by the English physiologist, Lord Cavendish, in the 18th century, by which the nitrogen and the oxygen of the atmosphere were made to produce combinations as a result of letting electric discharges pass through the air during the presence of a decomposition of alkali. The Norwegian method carries out this principle on a larger scale, with the aid of new auxiliaries. First of these is the electric furnace, which is the fundamental element of the whole process. Into this furnace air passes, and is heated to a very high temperature. Inside the furnace are placed two electrodes, the fraction of an inch apart, and through these there runs an alternating curent of 5,000 volts. In order to strengthen the effect of the electrical discharge on the air and the further oxidation of the nitrogen, it is important to give the arch flame, which produces the heat, the largest surface possible. It has been known that the arch flame changed its form under the influence of a magnet, and this fact has been cleverly used to further the above end, as the two electrodes are placed between a powerful electro-magnet, deriving its energy through an even current. By this method the arch-flame is subjected to a series of very rapid displacements, the final result being the formation of an electric flame of the shape of a disk, and of a diameter of nearly six feet. The air sweeps this flame disk on both sides, and is thereby momentarily heated to the very high temperature which is required for the oxidation of the nitrogen. The gas escaping from the furnace must immediately be cooled, in order to avoid loss of nitrogen. The gases are then led to a series of towers—so-called oxidation towers—and then to absorption towers, which are built partly of granite, partly of wood, and where the gases are conducted over limstone sprinkled with water. There is now only left the concentrating of the decomposition by steaming, and this is effected in large pans, first by the aid of steam and later by direct heating by coal. The mass is steamed to a fusing point of 145 degrees and is then poured into tin cylinders, where it congeals by cooling. In this form the product is sold to manufacturers of chemicals. They prize the product highly on account of its purity.

For fertilizing purposes, the product is broken into the form of powder, and this stuff, which holds about 13 per cent of nitrogen, is the so-called lime saltpeter or calcium nitrate. It is much like salt, easily dissolvable in water, possessing hygroscopic qualities, so that it has been produced in melted form and afterwards in grain form. This latter form is that in which it is now sold to the trade and put upon the market. It is shipped in wooden barrels, lined inside with paper.

The company which owns the works at Nottoden, where the above described operations are carried out, has a capital of several millions, and employs waterfalls for the generation of electricity. They have a force of about 40,000 horsepower at the present establishment, and expect to have this year an output of 20,000 tons of nitrate of lime. The question has been asked, if this new product is suitable as a fertilizer, and if it is equal to Chilean nitrate. The consul says that experiments seem to show that the electric saltpeter not only holds its place alongside the Chilean product as a fertilizer, but that by its possession of lime it has advantages over the latter, especially on certain soils.

TORPEDO BOATS IN CHINESE FLOATING DOCK.

By Frank C. Perkins.

However unprogressive the Celestial Empire may be in the interior, the demands of commerce have caused its harbors to be equipped with modern apparatus. The interesting illustration here given shows a floating dock at Tsingtan, with two torpedo boats and a river boat raised ready for repairs and inspection by the Emperor's Navy officials.

This dock which is electrically operated, was constructed by German engineers, and has a capacity of 16,000 tons with a total length of 380 feet. It is 120 feet wide and 60 feet high and is capable of raising a ship having a draught of 30 feet.

A large number of electric motors are utilized on this dock for hoisting and other purposes, including the raising of the dock by pumping out water from the ten compartments of the pontoons. Centrifugal pumps are employed for this purpose, and the five pontoons can be pumped out in two hours, raising a ship of 16,000 tons capacity in about that time.

The electric controllers are mounted in a central operating room, so that all of the motors may be handled by a single operator and the water regulated as desired. Electric lights are provided and a complete power station supplies current for hoisting, for tools, and for both arc and incandescent lamps.



For anchoring this dock in the Tsingtau Harbor, there are eight stud link chains 3 inches in thickness, and four similar chains 2½ inches in thickness. These chains are raised and lowered by electric hoisting mechanism, all controlled from the central operating room. The dock has a total weight of 8,000 tons, and is one of the most up-to-date and best equipped floating docks in any of the Chinese harbors.

Lighting Harbors.

A new and ingenious device for illuminating harbors is described in the *Engineering Digest*. It consists of a cable, having connected at intervals short branches to which are attached incandescent electric lamps, fitted with reflectors which concentrate the light into parallel beams as nearly as possible, and send it upward. The lamp and reflector are made sufficiently buoyant to maintain an upright position. The cable is then laid in the proper position in the harbor, and connected with a source of electric supply on shore. The course of the channel will thus be marked out by brilliantly lighted spots on the surface of the water. It is well known that even the highest waves do not produce any disturbance at a short distance below their own depth. The cable with its lamps will therefore always be in practically still water. An important feature of the system is that it offers as good guidance in dense fog as in clear weather. The beam of light would project from the level surface of the water up through the fog: or a tube with an observation glass adapted for use in water, might be employed in the hull of the vessel, so that it would be possible to guide the ship without reference to the surface light.

Preservation of Piling Against Marine Borers.

The length of service of piles in wharfs and other marine structures is greatly shortened by the attack of marine borers, or shipworms. A method of protection, both efficient and cheap, is much needed, the more so because the timbers best suited for piling are becoming very scarce and are increasing rapidly in price.

Marine borers are found as far north as Maine and Alaska, though they are more numerous and destructive in the warmer waters farther south. Since they require only a small exposed surface in order to gain entrance and completely destroy a pile, any effective means of preservation must protect the wood from high-water mark to a point in the mud below which the borers do not go.

A number of excellent methods have been devised for protecting piling by external coatings or sheathings, any of which, properly applied, will increase the life of the pile. Three factors which decrease their efficiency are the corroding action of salt water, the wash of waves which injures and often breaks the casing, and the dangers from floating timbers and debris. Thick iron cases resist damage from these sources for a long period, but they are very expensive.

The injection of preservatives through holes bored in the top of the pile, or near the mud line, has failed to secure a distribution sufficient to adequately protect the outer layers of wood. All soluble salts have also shown a tendency to leach out when exposed to salt water. Impregnation with creosote, a coal-tar product, has usually proved highly efficient with suitable kinds of timber properly prepared, when a sufficient quantity of good creosote is used.

The principal timbers used for piling are longleaf, shortleaf, and loblolly pine, and white and red oak on the Atlantic coast and Gulf of Mexico, and Douglas fir on the Pacific coast. Spruce, redwood, cedar, cypress, eucalyptus, and palmetto are used locally. All of these woods with the exception of palmetto are subject to damage by borers. Hardness is not a complete barrier to their attack, although boring is probably slow in dense woods. Southern pine and oak can be impregnated with creosote, and this promises to be one of the most efficient means of resisting the borers. It is probable that some of these timbers can be successfully treated by the open-tank process. However, if a very heavy absorption is desired, a treatment under pressure may be the more efficient.

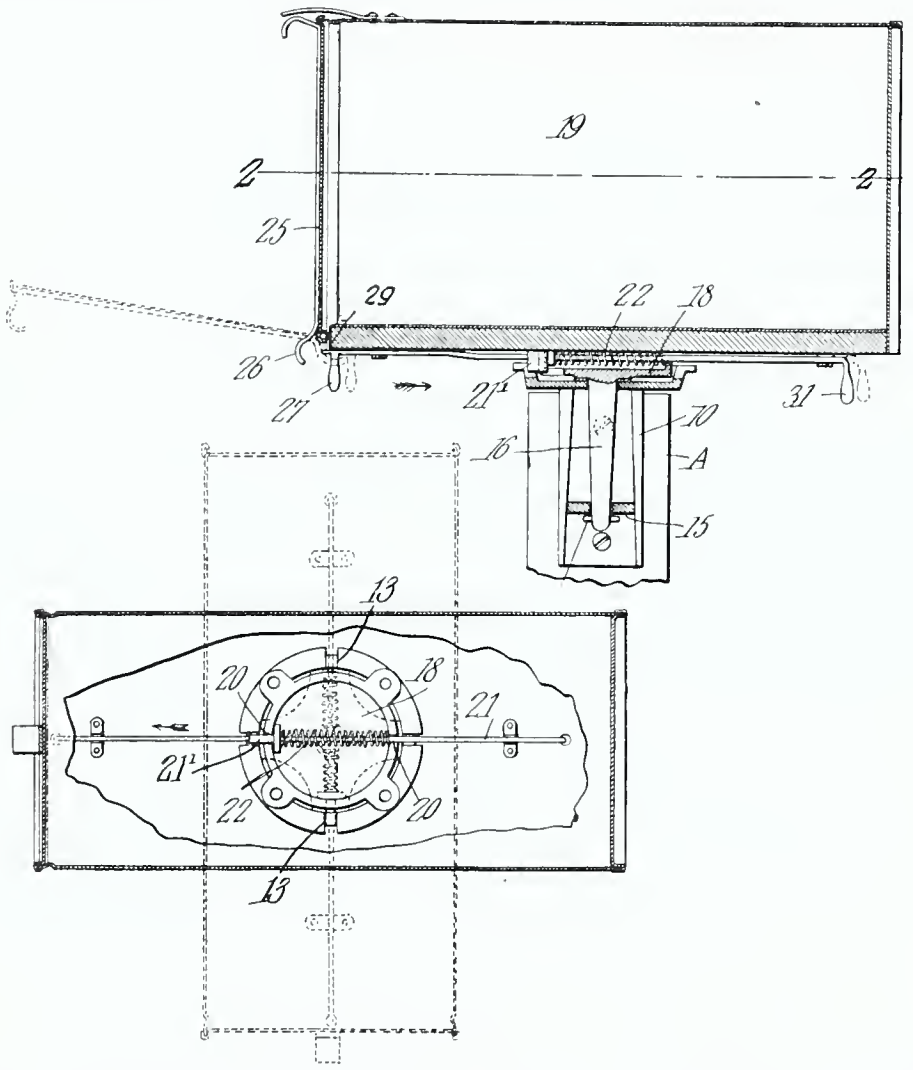
Circular 128, just issued by the Forest Service, gives a detailed description of the most important marine borers and their habits, together with a discussion of the different forms of mechanical devices in use for the protection of piling and of protection by chemical preservatives. This publication will be sent free upon application to the Forester, Department of Agriculture, Washington, D. C.

CLEVER NEW PATENTS.

MAIL BOX.—LINING FOR WALLS.—SETTING MECHANISM FOR WATCHES. STEEL TANK.

Mail Box.

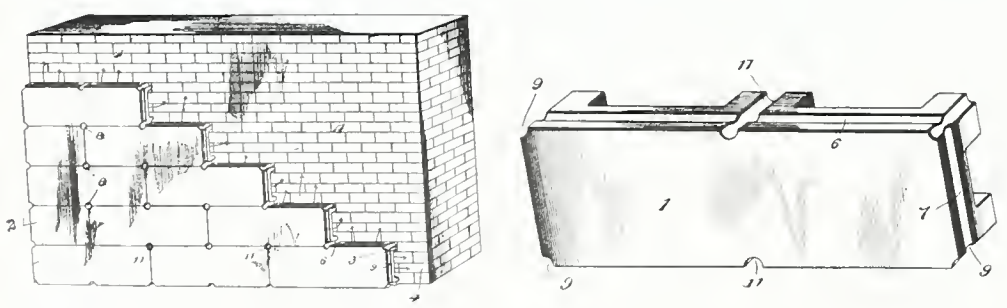
It is a well known fact that the best type of mail box for rural routes is that which causes the least delay to the carrier. Many different devices with this end in view have been proposed, and Mr. John M. Scobee, of Bagdad, Ky., has secured a patent on a decidedly unique structure. As shown in the accompanying views, a casting 10 is secured to the upper end of a supporting post *A*, and the mail box 19 has fastened to its bottom a pivot pin 16, that is journaled in this casting. Slidably mounted on the bottom of the box 19 is a locking bolt 21 having a tooth 21^1 that is arranged to engage in different sockets 13 formed at the top of the casting 10. The bolt 21 has downturned handle portions 27 and 31, the former of which is disposed in the path of movement of a depending lug 26 carried by the closure door 25 of the box. There is no signal to the box, for the position of the box indicates whether or not there is mail therein. The patron when he places mail in the box arranges the same with the door so that it can be readily reached by the collector or



carrier, and the latter by swinging the door to open position, not only gains access to the interior of the box, but the lug 26 striking the handle 27, unlocks the box so that it can be turned. The carrier therefore moves the box to a different position that indicates whether or not there is mail for the patron, and as soon as the door is closed, the box is relocked. Inasmuch as the unlocking and opening of the mail box door automatically unlocks the box, it is a simple matter for the carrier to turn the box to either signaling position without the necessity of operating any other releasing devices, and it is to his own interest to move the box from a position which would otherwise necessitate his stopping to examine the box on the next trip or trips.

Lining for Walls.

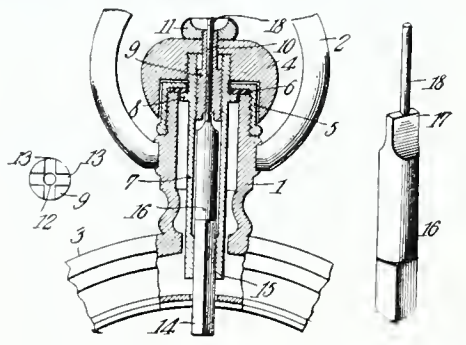
Mr. Lemuel Patterson, of Olean, N. Y., has secured a patent on a lining for walls intended to prevent dampness and sweating, and capable of receiving a coating of plaster, wall paper or other wall covering. The lining as disclosed in the patent consists of a series of blocks or sections of square or oblong



form, and provided at their inner or rear faces with projections or lugs that are arranged to fit against the wall and space the body portions or sections therefrom. The blocks or sections are provided at their edges with registering notches or sockets 9 and 11, which form openings, and nails or other fastening devices are passed through the openings into the wall and secure the blocks or sections to the same. The space around the fastening devices is designed to be filled with cement, whereby the parts will be perfectly tight when the lining is complete. The blocks, besides providing a perfectly dry wall, are adapted also to increase the strength of the structure to which they are applied.

Setting Mechanism for Watches.

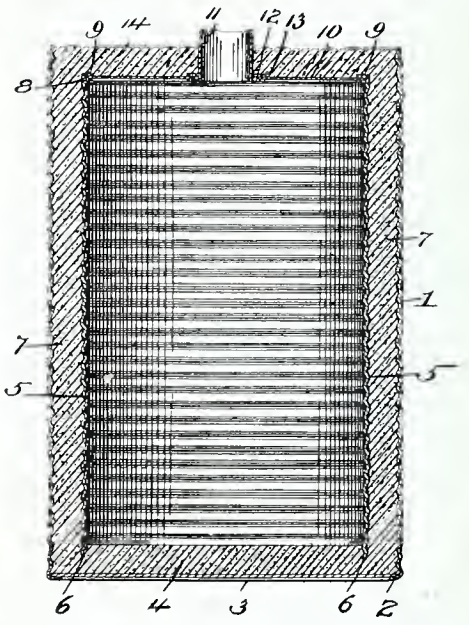
As is well known, pendant-set watches are objectionable inasmuch as the hands will sometimes be accidentally moved or set through the pulling out of the stem, and yet, in other features, the pendant-set watch has decided advantages over the lever set. Mr. Michael Sporleder, of Colorado City, Colorado, has devised an improvement for pendant-set watches, whereby the accidental change of the hands is absolutely prevented. The pendant 1 has a sleeve 7 located therein, that is rotatable, and a set screw 9 is carried by the sleeve, and has a threaded extension projecting beyond the crown 4 and provided at its inner end with a seat 13. The winding square 16 has a reduced portion 17 to engage in the seat, and also has an extension 18 that projects through the set screw and beyond the outer end of the same. The outer end of the set screw 9 is threaded, and a sub-crown 11 is screwed thereon. In setting the watch, it is necessary to steady the crown 4 with one hand and with the other loosen the sub-crown 11. After depressing the winding square by pushing the extension 18, the sub-crown is unscrewed to its limit, after which the crown may be turned to set the watch.



The crown is again steadied, the winding square depressed and the sub-crown reseated until it bears against the crown, thus effectively locking the parts against accidental relative movement.

Steel Tank.

Owen K. Harry, of St. Louis, Mo., whose assignee is the O. K. Harry Steel Co., a corporation of Missouri, has recently obtained letters-patent for an improved steel tank that is adapted for containing fluids of any class and can be disposed either above or below the surface of the earth. The invention, as shown by the accompanying illustration, comprises an outer shell 1 having an inturned annular flange 2 upon which is disposed



a circular bottom 3, preferably sheet metal. Upon the bottom 3 is disposed a layer of cement or concrete, and the inner shell 5 disposed concentrically within the outer shell 1 and the lower edge is thus forced a distance into the bottom layer of concrete. The inner shell 5 is smaller than, and spaced from, the outer shell; and the space between is filled with cement as shown by numeral 7 An annular sheet 10 is provided at the top and is adapted to retain a layer of cement 14. A central opening comprising a tubular structure 11 is arranged in the top and is secured to the annular sheet 10 by means of upper and lower flanges 12 and 13, which engage the opposite sides of said sheet.

PATENTS

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

GENERAL ELECTRIC CO. v. BULLOCK ELECTRIC MFG. CO. et al.

(Circuit Court of Appeals, Sixth Circuit. March 21, 1907. 152 F. R. p. 185.)

PATENTS-INVENTION-FIELD-MAGNET POLES.

The Reist patent, No. 573,107, for means of securing field-magnet poles, is void for lack of patentable invention.

BALL & SOCKET FASTENER CO. v. PATENT BUTTON CO.

(Circuit Court, D. Connecticut. March 13, 1907. 152 F. R. p. 187.)

PATENTS—CONTRACTS-CONSTRUCTION-SALE OF PATENTS AND INVENTIONS.

A contract by which defendant transferred to complainant all of its rights in certain patents and in inventions for "separable fasteners of the kind hereinafter defined but no others" construed, and held to cover only separable fasteners of the snap variety, in which the resiliency is in the socket and not in the stud or post; it being shown that they are two distinct types, of which that is the distinguishing feature, and that all of those covered by the patents or identified by the contract were of the former type.

GENERAL ELECTRIC CO. v. BULLOCK ELECTRIC MFG. CO. et al

(Circuit Court of Appeals, Sixth Circuit. March 21, 1907. 152 F. R. p. 427.)

1. PATENTS—INVENTION — FUNCTIONS NOT SPECIFIED.

It is not necessary for a patentee to describe in detail all the beneficial functions which he claims will result from his invention; but it is enough if such functions are evident and obviously contribute to the success of the invention, and they may in such case properly be taken into account in estimating its novelty and utility.

2. SAME-TRANSFER OF DEVICE TO NEW ART.

The relation between the mechanical and electrical arts is not so close that the adaptation of a known mechanical device to a new use in an electric motor may not involve invention, where the result is an improvement over prior constructions of great utility and success.

3. SAME—ELECTRIC MOTOR.

The Parcelle patent, No. 463,704, for an improvement in an electric motor and dynamo, which consists of means for detachably fastening a laminated pole piece to the solid yoke, covers an improvement of utility and great commercial success, which involved magnetic and electric, as well as mechanical, problems, and was not anticipated, and involves invention; also held infringed.

GUNN et al. v. BRIDGEPORT BRASS CO.

(Circuit Court of Appeals, Second Circuit. March 12, 1907. 152 F. R. p. 434.)

PATENTS—INVENTION—CARD RECORDS.

The Gunn patent, No. 583,227, for a system of card records, the improvement claimed being a carrying of the subdivision or classification one or more steps beyond what was possible with the records of the prior art, is void for lack of patentable invention, as merely a more minute subdivision by the larger use of division cards differentiated by means used in the prior art.

EDISON GENERAL ELECTRIC CO. v. CROUSE-HINDS ELECTRIC CO.

(Circuit Court of Appeals, Second Circuit. March 12, 1907. 152 F. R. p. 437.)

1. PATENTS—CONSTRUCTION OF CLAIMS.

Where an alleged element or characteristic feature of an invention is not necessarily inherent in the invention itself, the failure of the patentee to refer to it is persuasive evidence that it is not within the scope of his invention, and, not being disclosed to the public, it should not be read into the patent.

2. SAME—INFRINGEMENT—LAMP SOCKET.

The Metzger patent, No. 489,682, for an electric lamp socket, which as stated in the specification consists primarily in a socket having an insulating body with an extension on which the terminals are mounted, cannot be construed to cover a secondary structure not having such extension, no such device being shown in the specification or drawings, and all the claims must be construed to include the extension as an element. As so construed, held not infringed.

DEY TIME REGISTER CO. v. SYRACUSE TIME RECORDER CO.

(Circuit Court, N. D. New York. April 2, 1907. 152 F. R. p. 440.)

1. PATENTS—INFRINGEMENT — EQUIVALENT PARTS IN COMBINATION.

Where a patent is for a mere improvement consisting of a new combination of old elements, the range of equivalents is narrow.

2. SAME.

A substituted part in a patented combination, in order to coustitute an equivalent which will not avoid infringement, must not vary in any manner the idea of means, and, while it may perform some new or additional function, and still be an equivalent, it must perform all the functions of the element for which it was substituted in substantially the same way, and be a mere change of parts and form involving no inventive skill, but suggested by the patented invention itself to every person skilled in the particular art. If it not only performs the functions of the element for which it is substituted, but introduces into the combination a new idea or a much more extended development of the idea of means, it is not an equivalent, but a patentable improvement.

3. SAME—WORKMAN'S TIME RECORDER.

The Dey patent, No. 524,102, for a workman's time recorder, discloses no new or novel mechanism or means, but is for an improvement only which consists in a reorganization of old parts to produce a better operation and an improved result, and must be construed and limited accordingly. Claim 1 is not infringed by a machine in which the platen, which is an essential element of such claim, is wholly dispensed with, as well as the mechanism necessary for its operation, without the substitution of a new part; its functions being devolved on a remaining part by a change of mechanism and a different mode of operation.

WESTINGHOUSE ELECTRIC & MFG. CO. v. NATIONAL ELECTRIC CO.

(Circuit Court, E. D. Wisconsin. February 20, 1905. 152 F. R. p. 466.)

PATENTS-INFRINGEMENT-ELECTRIC MOTORS.

The Tesla patents, Nos. 381,968, 381,969, 382,280, and 382,281, for electric motors, construed, and held infringed.

MOXIE NERVE FOOD CO. OF NEW ENGLAND v. MODOX CO. et al.

(Circuit Court, D. Rhode Island. February 20, 1907. 152 F. R. p. 493.)

1. TRADE-MARKS AND TRADE-NAMES—SUIT FOR INFRINGEMENT—BURDEN OF PROOF.

A complainant, seeking the aid of a court of equity in protection of his rights in a proprietary medicine, should be required as a part of his affirmative case to allege and prove that his preparation is what it purports to be, and is represented to the public to be, there being no presumption that such representations are true upon which the court can act.

2. SAME—RIGHT TO RELIEF IN EQUITY—FRAUDULENT REPRESENTATIONS TO THE PUBLIC.

Complainant manufactured and sold in bottles, a liquid called "Moxie Nerve Food" or "Moxie," which was represented to the public by the labels and wrappers to have been prepared "from a simple sugar cane like plant grown near the equator," discovered by a Lieutenant Moxie, and to be a nerve food which had recovered brain and nervous exhaustion; also paralysis, softening of the brain, locomotor ataxia, and insanity, when caused by nervous exhaustion. In a suit for an injunction restraining infringement of the trade-mark under which the preparation was sold, and unfair competition, the bill did not allege that such representations were true, nor that the preparation contained such ingredient or the properties so claimed for it; and no evidence was introduced to show that it contained any ingredient which waranted the name of "nerve food," or to show a reasonable basis for a belief that the statements as to its curative powers were true. On the other hand, defendant introduced the evidence of physicians and chemists who made analyses of the preparation and of a former employe of complainant, which established affirmatively a very strong probability that the statement that the liquid was a preparation from a plant such as described was pure fiction, and that it was merely root beer, containing no nerve food or other curative agent, except perhaps a small amount of a bitter principle such as gentian or cinchona. Held, that under such state of the evidence, complainant was not entitled to the protection of a court of equity even as against undoubted infringement and unfair competition.

THOMSON-HOUSTON ELECTRIC CO. v. ILLINOIS TELEPHONE CONSTRUCTION CO. et al.

(Circuit Court of Appeals, Seventh Circuit. January 11, 1907. 152 F. R. p. 631.)

PATENTS—INFRINGEMENT-ESTOPPEL BY IMPLIED LICENSE.

The sale of electric engines, which could only be used by the purchaser in connection with a trolley switch or device covered by a patent owned by the seller, without any restriction in the contract, carried with it an implied license to use such device, not only with the engines so sold, but as well with others bought from other makers, and the seller cannot claim such use to be an infringement; nor is it material that it usually restricted the right to a use in connection with its own engines or cars, where no notice of such custom was given to the purchaser.

BATES MACHINE CO. v. WILLIAM A. FORCE & CO.

(Circuit Court of Appeals, Second Circuit. February 26, 1907. 152 F. R. p. 634.)

PATENTS—INFRINGEMENT—NUMBERING MACHINES.

The Bates patent, No. 721,276, for a typographic numbering machine, narrowly construed as required by the prior art, held not infringed.

STANDARD SANITARY MFG. CO. v. J. L. MOTT IRON WORKS.

(Circuit Court, D. New Jersey. April 8, 1907. 152 F. R. p. 635.)

1. PATENTS—PRIOR USE—EVIDENCE TO ESTABLISH.

Evidence considered, and held insufficient to establish prior invention of a patented device, in the absence of the testimony of the alleged inventor, or any showing that it could not be obtained, and where the device itself was not produced, and appeared from the testimony to have been at most an abandoned experiment.

2. SAME — VALIDITY AND INFRINGEMENT—DREDGER FOR ENAMELING.

The Arrott patent, No. 633,941, for a dredger for pulverulent material, used in the enameling of bath tubs, having a pneumatic agitator contained in the hollow handle, adapted to vibrate the sieve to secure a uniform distribution of the material, was not anticipated and discloses patentable invention; also held valid as against a claim of prior use, and infringed.

COMMERCIAL ACETYLENE CO. v. AVERY PORTABLE LIGHTING CO.

(Circuit Court, E. D. Wisconsin. December 22, 1906. 152 F. R. p. 642.)

1. INJUNCTIONS—SUBJECTS OF INJUNCTION—SUITS IN OTHER JURISDICTIONS.

A federal court of equity has power to enjoin either party to a suit before it from prosecuting other suits subsequently brought relating to the same subject-matter, where it would be contrary to equity and good conscience, although such suits may be in foreign jurisdictions.

2. SAME — PATENTS — INFRINGEMENT—RESTRAINING MULTIPLICITY OF SUITS.

Where the owner of an unadjudicated patent has brought suit against a rival manufacturer to enjoin infringement of such patent and to recover profits and damages on account of the manufacture and sale of an alleged infringing device, in which suit both the validity of the patent and infringement are put in issue, the court may, and should, on a proper showing, enjoin the complainant from instituting a multiplicity of suits in different parts of the country against customers of the defendant, who are charged with infringement solely by reason of the sale or use of defendant's device, until the issues are determined in the principal suit before it. As to such suits which were commenced before the application for injunction was made, however, the defendant will be left to his remedy by applying for a stay to the courts before which they are pending.

ENOCH MORGAN & SONS CO. v. WARD.

(Circuit Court of Appeals, Seventh Circuit. February 11, 1907. 152 F. R. p. 690.)

1. TRADE-MARKS—UNLAWFUL COMPETITION—DRESS OF PACKAGE—ELEMENTS—ENSEMBLE.

A manufacturer may put forth his goods in a dress, in no element of which—size, shape, color, lettering, word, or symbol—has he an exclusive right of use; and yet, if the ensemble has come to be a public guaranty of origin and quality, he may secure protection against unfair trade of a preying competitor.

2. SAME—WORDS AND SYMBOLS.

Where a word or symbol is of a character to be appropriated, and has been duly appropriated as a trade-mark, it becomes property, which a competitor has no right to use, either alone or in connection with matter to which its owner lays no claim, without such owner's consent.

3. SAME—DIFFERENT TRADE-MARKS—SEPARATE USE.

Where complainant adopted two trade-marks which it registered and used separately in its advertisements, one being a coined word and the other a pictorial representation, the fact that both were jointly used on the wrapper of its manufactured article did not enable a competitor to use one of them alone.

4. SAME—SAPOLIO—INFRINGEMENT.

Plaintiffs' predecessor placed on the market a scouring soap, in the form of a cake, wrapped in silver paper, with a broad blue band having the name of the firm on one side and the coined word "Sapolio" on each end and on one side, and the pictorial representation "of a young man's face observing itself reflected in a pan" on one side. After complainant's product had been well and widely known, defendant put out a powder in a round can, dressed in yellow, called "Sopono" with a young woman's face observing itself reflected in a pan. Held, that defendant's label constituted an infringement.

AMERICAN BRAKE SHOE & FOUNDRY CO. v. RAILWAY MATERIALS CO. et al.

(Circuit Court of Appeals, Seventh Circuit. January 22, 1907. 152 F. R. p. 700.)

PATENTS—INVENTION—BRAKE SHOE.

The Herron patent, No. 423,996, for a brake shoe of the composite type, having wrought-iron bars imbedded in the casting for the purpose of strengthening it, is void for lack of invention. The composite shoe itself was old in the art, and the method of re-enforcing castings by imbedding wrought iron strips therein was old in the casting art, and practiced generally by foundrymen. Also composite brake shoes had previously been strengthened by others by applying a wrought-iron backing plate and by strips placed on the sides, and the transference of such plates or strips to the middle of the shoe by the well-known foundry method did not involve invention nor accomplish any new practical result.

DIAMOND METER CO. v. WESTINGHOUSE ELECTRIC MFG. CO.

(Circuit Court of Appeals, Seventh Circuit. January 31, 1907. 152 F. R. p. 704.)

PATENTS—ELECTRIC POWER TRANMISSION—SPLIT-PHASE MOTORS.

The inventions covered by the Tesla patents Nos. 511,559 and 511,560, for a method of transmitting electrical power and means for practicing such method known as the "Split-Phase Motor," held, under the evidence, to have been made prior to April 20, 1888, and therefore not anticipated by the Ferarris or Shallenberger publications. Such patents disclose invention, and were not anticipated by anything in the prior art, nor are they for the same invention as patent No. 401,520, previously granted to the same inventor on a later application and also covered by the British patent No. 6,527 of 1889, and therefore do not constitute a case of double patenting, and are not affected by the expiration of such British patent.

DAVIS et al. v. GARRETT.

(Circuit Court, D. New Jersey. April 9, 1907. 152 F. R. p. 723.)

PATENTS-SUIT IN EQUITY TO OBTAIN PATENT—PROCEDURE ON DEFAULT.

In a suit in a Circuit Court under Rev. St. § 4915 [U. S. Comp. St. 1901, p. 3392], to obtain a patent, application for which has been refused by the Patent Office and the appellate tribunal, the complainant is not entitled to a decree adjudging his right to a patent as a matter of course on default by the defendant, but must establish such right, including the patentability of his alleged invention by proofs, and where the defendant has entered an appearance, although in default for want of pleading, he is entitled to notice before final decree is entered.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Joseph C. McCollum, Dexter, Mo., inventor; Lee Westenhaver and Krates C. Spencer, Bloomfield, Mo., assignees. Churn.—An object of the present invention is to provide an easily operated churn, capable of adjustment to adapt it to the strength of the person operating it and to the quantity of cream to be churned. Another object of the invention is to provide a churn having means for adjusting the dasher to the desired elevation and having operating mechanism for actuating the dasher, and capable also of adjustment to vary the length of the stroke.

Joseph A. Glancey, Seaton, Ill. Revolving Derrick.—An object of this invention is to provide a derrick designed particularly for use on farms for handling animals in farm butchery, and capable of enabling hay racks and wagon bodies to be readily placed on, and removed from, their running gear without straining or otherwise injuring them. Another object of the invention is to provide a derrick capable of easy operation to enable either a man or boy to readily handle a load, such as a wagon body or hay rack.

Jesse J. Swint, Roanoke, Ala. Animal Trap.—An object of the present invention is to provide an animal trap, designed for catching mice, rats, and other small animals, and adapted to be sprung and automatically reset by the weight of an animal, whereby it is capable of successively catching a large number of animals without requiring any attention.

George W. Wilson, Twin Falls, Idaho, inventor; James E. McEvoy, Hagerman, Idaho., assignee. Whiffletree Hook.—An object of this invention is to provide a whiffletree hook having means for effectually preventing a trace from becoming accidentally unfastened, and adapted to receive a harness having either a flat trace or a chain, whereby much time will be saved when changing a horse or team from a heavy wagon to a light vehicle, or vice versa. Another object of the invention is to dispense with the springs in the construction of whiffletree hooks, and to provide trace holding means adapted to be readily operated to fasten a trace or release the same from a whiffletree, and capable in event of breakage of being readily replaced at a small cost.

John W. Hart, Kansas City, Mo. Self Igniting Match Safe.—An object of the present invention is to provide a fire proof match safe having means for automatically igniting the matches as they are removed from it, thereby obviating the necessity of striking the matches upon walls and other undesirable places, and at the same time preventing the removal of more than one match at a time.

George R. Robinson, Bienville, La. Cotton Chopper.—An object of this invention is to provide a cotton chopper adapted to effectually thin out cotton plants, and capable of cultivating the plants left standing, and of providing means for affording absolute protection to such plants for preventing the same from being covered or destroyed by the cotton chopping or cultivating means.

George R. Robinson, Bienville, La. Cotton and Corn Stalk Cutter.—An object of the present invention is to provide a cotton and corn stalk cutter, designed for cutting the stalks of a crop of cotton or corn in preparing the land for another crop, and capable of bending or flexing the corn before the knives or blades come in contact with the same, whereby the stalks are more rapidly and effectively severed from the ground and are thrown outwardly from the stalk cutter. Another object of the invention is to provide a stalk cutter adapted to be drawn by one horse, and capable of simultaneously cutting two rows of stalks, and of depositing the severed stalks in every second row, and of leaving the intermediate row, in which the cutter operates, clear of the stalks, thereby enabling the stalks to be raked or otherwise removed in about one-half the time required when the rows are cut down one at a time.

Charles R. Holt and Wm. L. Hudson, Middlesworth, Ill. End Gate.—An object of this invention is to provide a combined end gate and scoop board, adapted to be readily applied to an ordinary wagon body or bed without interfering with the ordinary end gate, and capable of being readily adjusted to arrange it either in a vertical position for closing the rear end of a wagon body, or in a slightly inclined position to form a shoveling or scoop board.

Lewis P. Erickson, inventor; Dobbins Iron Works, Ltd., Jennings, La., assignees. Centrifugal Pump.—An object of this invention is to enable the capacity of centrifugal pumps to be increased and to operate the same with such increased capacity at an expenditure of less power than heretofore. Another object of the invention is to enable the centrifugal pump to be easily applied to a well casing and to operate therein with a minimum amount of friction.

George W. Tinkey, Plymouth, Ohio. Tire Setter.—An object of this invention is to provide a tire setter adapted to enable a heated tire to be readily placed on a wheel in proper positon with relation to the felly without hammering the tire. Another object of the invention is to enable great power to be easily exerted on a wheel in setting a tire, and to provide a device capable of securely engaging the tire and of enabling the same to be positively and gradually drawn on the felly.

Mary E. Duckworth, Belton, Tex. Garment Supporter.—An object of this invention is to provide a garment supporter, designed for the use of infants, children or ladies, and capable of being readily arranged to adapt it to the character of the garments to be supported, and having means for supporting the hose and lower garments from the shoulders, and for permitting perfect freedom of movement of every part of the body without chafing the same. Another object of the invention is to provide a garment supporter, which will neither tighten nor loosen when the wearer stoops, so that there will be no liability of tearing holes in the hose, or of permitting the garments to fall or loosen when the wearer stoops.

William G. Magoffin, Muskogee, Okla. Combination Hand Truck and Hoist.—An object of this invention is to provide a hand truck, designed for handling all kinds of goods, and equipped with hoisting means for raising and lowering the merchandise, or other goods carried by the truck. Another object of the invention is to enable the hoisting mechanism to be operated for raising and lowering the lighter class of goods with great rapidity and for affording great power for lifting heavy articles. The invention also has for its object to provide a truck, which when employed as a hoist, will remain firmly in an upright position and not have to be held to maintain it steady or prevent it from falling.

James D. Smith, Egan, S. D. Tire Bolt Wrench.—An object of this invention is to provide a tire bolt wrench adapted to be conveniently held and operated, and capable of ready adjustment for enabling it to engage nuts of different sizes, whether the same be embedded in, or are projected from, the felly of a wheel.

Carl A. Beethe, Fullerton, N. D. Swinging Stacker.—An object of the invention is to provide a stacker, adapted to be readily applied to any threshing machine, and capable of automatic oscillation, whereby the stacker is vibrated from one side to the other. Another object of the invention is to provide shifting mechanism for changing the direction of the oscillation of the stacker which is operated by direct contact with the latter, and cushioned to prevent injury to the gearing through such contact.

Patrick McRae Cave, Charlotte, N. C. Starching Machine.—An object of this invention is to provide a starching machine adapted to dispense with the help of one of the persons usually employed to run this class of machines, and capable, after collars, cuffs and other small articles are fed into it, of starching the same, wiping the superfluous starch from the articles, and depositing the articles upon a table or other receptacle. Another object of the invention is to provide means for preventing the articles from adhering to, and winding around the wiping rolls, and to enable the mechanism to be readily removed from the starch pan to permit the latter to be conveniently cleaned.

Tiberius C. Nelson, Winterville, N. C. Truck—An object of this invention is to provide a truck, designed for handling crates and various other kinds of freight and merchandise, and adapted particularly for use at railway stations and similar places. Another object of the invention is to provide a truck, which when run on a narrow platform, will not require turning to remove it therefrom, and which may be readily adjusted to enable either end to be used as the front.

Charles E. Mickley and Howard Gise, York, Pa. Automatic Railway Gate—An object of this invention is to provide a railway gate designed to be arranged at railway crossings, and adapted to be automatically operated by approaching trains and of indicating the approach of the same before closing, so that there will be no liability of a person or vehicle becoming caught between the gate members by a sudden inward movement of the same. Another object of the invention is to provide mechanism adapted to enable the force which opens the gate members to be also employed for retaining the same in their closed position, whereby the gate will be positively held closed until the train proceeds the desired distance beyond the crossing.

John E. Smart, New Bloomfield, Mo. Wagon Brake Coupling.—An object of this invention is to provide a device for coupling the connecting rod of a wagon brake to the upwardly extending arm of the transverse brake beam actuating shaft, for enabling the connecting rod to be readily attached to, and removed from, the upwardly extending arm, when it is desired to place a wagon body on, or remove the same from, its running gear. Another object of the invention is to enable this operation to be easily and quickly performed without the use of a wrench or similar tool, and to effectually prevent the coupling pin or pivot from accidentlly releasing the parts.

Henry H. Gorton, Wallace, Mo. Farm Gate.—An object of this invention is to provide a jumping gate, designed particularly for use in a level or prairie country, and having means for dispensing with the use of large posts. Another object of the present invention is to enable the operating mechanism to partially counter-balance the weight of the gate, to render the operation thereof easy, and to provide means for effectually preventing the gate from being opened by stock.

John J. Gorman, Chicago, Ill. Lath for Building Purposes.—An object of this invention is to provide laths with means for enabling them to be accurately placed by inexperienced persons the proper distance apart to receive the necessary amount of mortar or similar material. Another object of the invention is to provide spacing means for the latbs adapted to co-operate with the same in bolding the plaster, and capable of preventing too many laths from being used within a given area.

Helmer Ogard, Ada, Minn., inventor; Theodore Iverson, Beltrami, Minn., assignee. Road Grading and Ditching Machine.—An object of this invention is to provide a machine, designed for grading and ditching ordinary high-ways for making turnpikes, and capable of being readily operated at eitber side of a turnpike and in any direction. Another object of the invention is to provide a grading and ditching machine having elevating means for carrying away the excavated sod and dirt, said elevating means being mounted for rotary movement and arranged to discharge the excavated material at a point beyond the turnpike and in any desired direction.

Elijah Marsalis, Smithdale, Miss. Drill Harrow.—An object of this invention is to provide a device, adapted to be applied to various kinds of cultivators, plows, harrows, and the like, and capable of pulverizing the soil and of working the same close to the plants without injuring the latter. Another object of the invention is to provide a drill harrow designed for use on both walking and riding implements, and adapted to obviate the necessity of following a cultivator or other implement with a hand hoe to complete the cultivating operation. The invention also has for its object to enable the teeth to be readily adjusted to vary the distance between them, and to arrange them properly with relation to the size of the plants under cultivation, and to provide means for clearing the device of sticks or other objects that might be forced over the plants by the harrow teeth.

Ervin S. Mummert, Hanover, Pa. Saw Attachment for Bench Vises.—An object of this invention is to provide a metal sawing device designed to be operated in connection with a bench vise of the ordinary construction, and adapted for cutting all kinds of material which may be held in a vise. Another object of the invention is to enable the attachment to be readily applied to, and quickly removed from, a vise to permit the latter to be used as an ordinary bench vise, and to provide saw-operating gearing and feeding mechanism, located at opposite sides of the vise, in position for enabling the saw to be rotated with the right hand and the material fed by the left hand, without necessitating a workman changing his position in front of the vise.

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FOR SALE—Nail Holder and Set, U. S. Patent No. 874,613, U. S. and Canadian rights. Will sell outright or on royalty. John A. McColm, New Plymouth, Ida. sep

FOR SALE—Patent No. 881,908. Drill rod, pipe or sucker rod holder. Holds rods or pipes automatically at any desired point. A labor-saver. Will sell cheap for cash or royalty. Address, S. L. Brannan, Garden City, Kans. sep

FOR SALE—Patent No. 873,864, dated Dec. 17, 1907. Animal Trap, now perfected and ready to prove its superiority over anything of the kind on the market. W. H. Howard, New Canton, Ill.

FOR SALE—U. S. patent on collapsible shipping crate; can be made in boxes or with slats or rungs. It is simple and strong, and is the only crate having a double set of lockings. Address, Ambrose S. Ray, Bellefonte, Pa. sep

FOR SALE or on royalty—Bale Tie. U. S. Patent No. 881,053, issued March 3, 1908. Aluminium, light, cheap, does not corrode; fine for cotton, wool and all baled materials. Address the inventor, Mrs Alice O. Brigance, Navasota, Texas. sep

FOR SALE—Patent No. 884,933, dated April 14, 1908. Nut Lock. Minimum number of parts. Simple to construct, and inexpensive to manufacture. For full particulars address, Charles Kesler, Marion, Ohio. sep

FOR SALE—Patent No. 885,519, patented April 21, 1908. Simplest railway train signal known. Must sell to get money for other inventions. Price $25,000. Capitalists, manufacturers, etc., investigate. Address, John Rebar, Smithdale, Pa. sep

FOR SALE—U. S. Patent 883,739, dated April 7, 1908. Cable Wire Attachment for end gate and scoop board. I sell because I have other business requiring my attention. Sell to highest bidder. Charles H. Polk, Kappa, Ind. sep

FOR SALE—Patent No. 881, 378, issued March 10, 2908, representing safety Stove Pipe Joint. Absolutely fire proof; a great necessity; easily manufactured; a valuable patent; will sell reasonably if bought at once. Address, O. M. Cowles, Devils Lake, N. Dak. sep

FOR SALE—Patent No. 885,599, April 21, 1908. Type Case. Metal compartments integral with bottom, which is perforated to keep dust from accumulating. Whole, half interest or royalty. Address, J. Gallemore, Washington, Mo. sep

FOR SALE—For cash, Patent No. 885,140, Window Ventilator and Curtain Fixture, whereby when the upper sash is lowered the curtain will also be lowered permitting the room to be ventilated without disturbing the curtain. Address, Oliver E. Brown, Washington, Iowa. sep

FOR SALE—Patent No. 885,023 April 21, 1908. Observers of actual test say: "Best I ever saw." "Much superior to pneumatic check" "Simple, accurate in its working." For particulars address, E. S. Deloe, 3129 Cedar Street, Philadelphia, Pa. sep

FOR SALE—U S Patent No. 884,159. Aluminium Dental Plate. Perfect plate; lighter and cheaper than gold; no rubber in roof of mouth; rubber and aluminium cannot separate; partial and full plates in actual use one year and a half. Address, E. A. Jackman, Hartington, Neb. sep

FOR SALE—Patent No. 871,637, dated Nov. 19, 1907. Gate. Closes and opens in either direction and is above ground. Want to sell outright at once. Can be manufactured cheaply. Address, Christoph Schaffer, Melville, N. Dak, sep

FOR SALE—Patent No. 877,974, dated February 4, 1908. Horseshoeing Stall. Provides a simple and practical apparatus for shoeing a vicious animal without injury to the blacksmith. Address, Lewis Pendleton, Standardsville, Va. sep

FOR SALE—One-half interest in Whey Measuring Apparatus, other half held by a company in Ottawa. Patented in Canada, April 18, 1905, No. 92,732; in U. S. April 28, 1906, No. 818,545. Used in cheese factories, easily manufactured, and sells well. Nothing in the market to equal it; reasonable terms to a good and responsible party. Address, H. R. MacDonald, Alexandria, Ont., Canada. sep

FOR SALE—Patent No. 871,333, dated November 19, 1908. Spacing instrument to divider, and measurement of solid columns—or tubular inside and outside. Cheaply manufactured, and large profits; good help for mechanics, designers, and all branches of professions. Address, Gandolfo Giambra, 167 12th Avenue, Paterson, N. J. sep

FOR SALE—Outright U. S. Patent No. 878,443. Grain Chute for breaking into cars. Every dealer in grain cars can save time and money with it; fully tested. Reference given. Address, A. G. Young, 69 State St. New London, Conn. aug

FOR SALE—Patent No. 866,678, dated Sept. 24, 1907. Work holding means. Must sell at once on account of sickness. Will sell to highest bidder. Address, Olaf Pearson, 318 North Sarah Street, Escanaba, Mich. aug

FOR SALE or royalty—Application Serial No. 395,247, allowed March 5, 1908. Picture Hanger. Permits frame to hang at any distance from floor, at any slant desired; is adjustable, and safe on light and heavy frames. Address, Wm. Newgent, West Baden, Ind. aug

FOR SALE—For cash at reasonable rates Patent No. 877,956, dated February 4, 1908. Water elevator using pneumatic pressure. Used in wells, reservoirs or other sources of water supply. Address, M. R. Shrouds, North Powder, Oregon. aug

FOR SALE or let—Patented July 1907. Trunk binder device with lever purchase. The only one ever devised. A child can bind a trunk quick and easy, and lock. Address, H. J. Patterson, St. Johns, Michigan. aug

FOR SALE—To manufacturers and dealers in good new inventions. I have a new and complete improvement over double-foot plows, for which I will sell at a close price. None of the territory yet sold. I wish to sell all together. Address, W. L. Selman, Summerville, Ga. aug

FOR SALE—Patent No. 878,047, Hasp Lock. Will sell outright or lease on royalty. Terms to suit purchaser. Address, George F. Darracott, Aberdeen, Miss. aug

FOR SALE—U. S. Patent No. 876,758, issued January 14, 1908. We have a working model, making a double engine, of a simple engine, with same amount of steam. Henry C. Wolf & Leo S. Wolf, R. D. Route No. 4, Catawissa, Pa. jy

FOR SALE—Patent No. 881,769, dated March 10, 1908. Sympathetic vibratory attachment for violins, or similar bowed instruments. Increases the duration and improves the quality of tones. Has been fully demonstrated. Address, John Y. Brown, Providence, Ky. jy

FOR SALE—Patent No. 878,228, dated Feb. 4, 1908. Cabinet. Used in grocery stores. Dust proof. Opens and closes without using the hands. Operates by a treadle. Fine for lard, butter, and for the kitchen to keep bread, flour, and meal. Full information given on application. Address, S. D. Newman, Jellico, Tenn. jy

FOR SALE or royalty—Animal toys made from card board or paper material. Cheaply manufactured. Amusing and instructive. Would be great sellers. Address, W. T. Wood, Nashville, Tenn. sep

FOR SALE—Envelope that cannot be opened without detection. Can be manufactured at exceedingly small cost. Wish to sell outright $10,000 cash. Very simple yet most effective on the market. Additional cost of manufacturing will not exceed 1-10 of a cent each. Ellsworth Cowen, Bond Avenue, Barnesville, Ohio. aug

FOR SALE—Patent No. 878,938; a centrifugal churn, issued February 11, 1908. Will sell for cash or reasonable terms if good papers are given. Address, Erick A. Collin, Turner, Holt County, Nebr. aug

FOR SALE—Patent No. 878,063, dated Feb. 4, 1908. Lamp Burner. Simple, cheap and safe. Destined to supplant all ordinary oil burners. Large profits. For sale or on royalty. For particulars address, J. A. Helsabeck, Ether, N. C. jy

FOR SALE—Patent No. 863,099, dated August 13, 1907. Carpet Stretcher and Tacker. Must sell on account of sickness. Will sell to highest bidder. Gottfred Schilling, Prescott, Wisc. jy

FOR SALE—Patent No. 875,150. Hoist and Loading Machine. This machine will do the work of twenty men in railroad construction work. Can be built at small cost. Address, T. N. Carter. Norton, Va. jy

FOR SALE—Patent No. 869,608, dated Oct. 29, 1907. Also Canadian. Display rack for chairs, tables, go-carts, etc. A real necessity. Simple, very broad patent. Photos showing uses sent upon request. R. L. Wilcox, Port Leyden, N. Y. jy

FOR SALE—U. S. Patent No. 877,254, issued January 21, 1908. An appliance for unwinding barbed wire in building wire fence. A labor saver. Will sell cheap for cash. For particulars, address M. M. Swanson, Hamilton, Iowa. jy

FOR SALE—U. S. Patent No. 874,457, dated Dec. 24, 1907. Pocket Can Opener. Tourists will find it perfectly safe to carry in a satchel. The best folding can opener on the market. Address, L. P. Therriault, Bonfield, Ont., Canada. jy

FOR SALE—State, county and farm rights for best patent out; cement pipe machine; makes 1 1-4 inch pipe for 2½ cent per foot; iron pipe costs 12 cents; agents wanted everywhere; send for circulars. Ellis W. Buser, Dawson, Nebr. jy

FOR SALE—Patent No. 880,794, dated March 3, 1908. Breast strap connection, for connecting the breast straps to the ends of a neck yoke. Will facilitate hitching and unhitching and save much annoyance. Address, H. R. Henrichs, Lamont, Oklahoma. jy

FOR SALE—Patent No. 878,428. Cattle Stanchion. A handy convenient labor-saving device. Can be attached to any cattle stanchion and used every day, and also in case of fire. Address, H. Siedschlag, R. No. 2, Box 18, Monroe, Wis. aug

FOR SALE—Patent No. 862,803, and Patent No. 884,792 covering the Burke Railway Automatic Switch for street cars. Complete rights thirty-five thousand dollars. Address, Thomas J. Burke, 300 Chartres St., New Orleans, La. aug

FOR SALE—Drafting Apparatus, dated Jan. 22, 1907. Outright or on royalty. Do you want to market a good invention pertaining to drafting profession. Something worth while. Address, Thomas F. Williams, New Bethlehem, Pa. aug

FOR SALE—U. S. Patent No. 870,335, dated November 5, 1907. Floor Scrubbing Machine. Canadian patent applied for. Address, P. H. Apple, La Valle, Wisconsin. jy

WANTED.

WANTED—For sale or partner wanted. Some one with $2000 or more to become interested with patentee in the manufacture or sale of useful inventions. For full particulars address, Wm. Fanckboner, Schoolcraft, Michigan. jy

WANTED—Figures as to cost of constructing Patent No. 824,061. Address, Mrs. L. Borden, 359 E. 5th Ave., Spokane, Wash. aug

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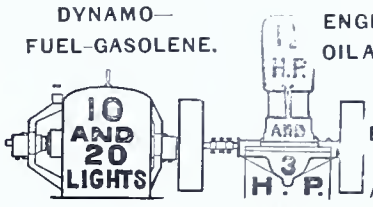
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The Work of the Chemist.

There is perhaps nothing that more clearly draws the line of demarkation between the medieval and the modern, than the contributions of applied chemistry to the welfare of man. A few generations ago, the pioneers in this path were hauled to the stake, as followers of the black art; and when an effort was made, during the French revolution, to save the life of a distinguished scientist, the authorities replied that the republic had no use for chemists. It is a long step from that position to the attitude of a leading American newspaper, which declared that the accidental death of Professor Curie, the discoverer of radium, was a greater loss to the world than the earthquake in San Francisco, where a thousand people perished and property worth half a billion dollars was destroyed. In spite of this appreciation of the power of scientific talent, however, we are apt to forget how much we owe to the chemist. Every great industry—agriculture, mining, manufacturing and transportation—is dependent upon scientific research. It is chemistry that has gathered the waste materials of the world, and utilized them for growing crops. Chemistry analyzes the plants and soils, increases the production from old sources, and extracts alimentary substances from new ones—as witness the enormous enterprise of obtaining sugar from the roots of beets. Chemistry has enlisted in the service of humanity the riches of the mineral kingdom. It has made possible the transportation systems that stretch like nets across the continents. It has been estimated that the Bessemer process of manufacturing steel adds, directly and indirectly, two thousand million dollars a year to the world's wealth. It is chemistry we have to thank for this. We cannot conceive of our present system of civilization enduring without the help of explosives, for which, again, chemistry is responsible. Entirely apart from their employment in wars, how could we carry on mining operations without them? How get stones from quarries? How construct roads and tunnels and waterways?

To instance a lesser application, the substitution of artificial for natural coloring matters must be reckoned among the triumphs of chemical science. Madder and indigo have succumbed to the attacks of the chemist, and other vegetable colors are being superseded in the same way.

But in spite of the marvelous strides that have been made, still wider fields of research await the chemist of the future. New methods of utilizing the resources of the earth, of unlocking the secrets of nature, lie before him: and it will be his duty to check the colossal losses that occur in every line of industry. Common clay is full of a commodity which, if it could only be extracted economically, would probably solve for centuries the question of a metal supply. Then the stock of coal within the earth is so limited that means of husbanding it must be found. In the ordinary steam engine, 90 percent of energy residing in the fuel is wasted. To stop this fearful loss and to recover the nitrogen of the coal, are questions the solution of which lies in converting coal into gaseous fuel; and the better utilization of waste gases from blast furnaces represents a further step. A cheaper supply of electricity would mean another important contribution to the material welfare of mankind. But perhaps the greatest problem of applied chemistry relates to the production of our food. To obtain from the inexhaustible supplies in the air about us enough nitrogen to replenish the exhausted soil of our fields, would indeed be an epoch-marking achievement. And steps in this direction have already been made. German professors have found that when air is liquified and the oxygen distilled, the resultant nitrogen can be used directly as fertilizer. There is also an establishment in Norway where the heat of the electric current causes the nitrogen and oxygen of the air to combine into nitric oxide, which is later oxidized, with the ultimate production of nitrates. Details of the process are given in another column of this issue.

These are but a few of the vital problems that confront the chemist. It has been well said that "if we were to take away what the chemists have contributed, the whole structure of modern society would break down at once. Every commercial transaction in the civilized world is based on the chemist's certificate as to the fineness of gold, which forms our ultimate measure of values. Faith may remove mountains, but modern society relies on dynamite. Without explosives our great engineering works must cease, and the Panama Canal, no less than modern warfare, become impossible."

Boiling Eggs Without Water.

The latest novelty exploited at a leading hotel of Chicago is the boiling of eggs without the use of water. The waiter places a box-like apparatus before the guest and turns on the electric current from a bracket on the wall. In a minute and a half, or about half the time consumed by the old process, the eggs are boiled to a turn. This new method of cooking has attracted much attention and comment, and acts as an effective advertisment for the hotel.

Harnessing Lightning.

Having converted the streams and the tides into electricity, modern physical scientists are endeavoring to utilize lightning for industrial purposes. To the electrician, the play of lightning seems a great waste of energy. An electrical storm possesses enough potential energy to drive many a factory wheel. A lightning flash several miles long casts athwart the earth an illumination so great and intense that our highest developed electrical lamps seem insignificant in comparison. It has been estimated that a flash of lightning two miles in length represents an expended energy of 10,000 killowatt seconds, or the equivalent of several hundred thousand incandescent lamps.

But that we have many misconceptions about lightning, says the New York *Times*, is apparent from recent investigations. A lightning flash frequently extends over several miles of space. A single flash of 10,000 volts an inch would thus require a potential difference of about 1,200,000,000 volts for the entire length of two miles. Such a voltage in the clouds is inconceivable. It is not in accord with our ideas of the nature of electricity. It should annihilate whole communities and destroy all human life within a radius of many miles. Aside from the question of killing us by the voltage, it would mean a frightful deluge of nitric acid. Far less than a fraction of this enormous voltage would electrically break down the air and produce ozone and nitric acid. What would be the unfortunate condition of the inhabitants of any district where a lightning flash caused a deluge of nitric acid, is something not pleasant to contemplate.

But such does not happen. Ever since man has inhabited the earth violent thunderstorms and electrical flashes have broken the monotony of summer's heat; and so far as the records show no remarkable visitation of unusual calamities has resulted therefrom. The reason now appears to be that our eyes are not capable of recording accurately this peculiar phenomenon of the heavens. It is an optical illusion, the watching of a flash of lightning. It is not one violent discharge, but a series. A flash two miles long is made up of 30 to 50 successive discharges, occurring so rapidly that their appearance seems simultaneous. The camera measures light much more sensitively and accurately than can the naked eye. Photographs show that there is rarely any single flash, but a series of disruptions. This being the case, a flash several miles long may occur without creating any great potential difference in the ends. The action of a discharge is much like a landslide down a steep hill. A slight movement of a pebble may start several other particles downward until the movement becomes general, and a landslide follows. A slight discharge of electricity from a cloud is followed by another and another, until the total is enormous. But the voltage discharged at any one time is relatively small. Sensitive recording instruments have begun to measure the flashes, and thus our knowledge concerning the electrical discharges of the clouds is becoming more accurate. It is known now that the duration of the discharge is about one-five hundred thousandths of a second—a duration utterly incomprehensible to the human mind. The average energy of the discharge at 10,000 kilowatt seconds would be equal to 7,000,000 foot-pounds, expressed in simpler language.

If we accept this potential energy of a flash of lightning, we might translate it into even plainer language by showing what it could do in work. In electrical science we speak of the kilowatt hour instead of the kilowatt second, and we know what can be accomplished by the kilowatt hour when electricity is harnessed. On this basis of computation, the flash of lightning would saw 830 feet of deal timber, if used with a circular saw; or if driving a grindstone, it would sharpen 14,000 knives. It would carry you nine miles in an electric automobile. It would pump 100 gallons of water to a height of 25 feet, three times.

Of course, there is no limit to what the flash would do, if properly harnessed and its potential energy stored so that it could be employed for driving machinery. Its usefulness would be limited only by the apparatus invented for doing man's work, and this, as we all know, is sufficiently varied to include almost every known labor. If the day should ever come when electrical discharges could be used to serve man, a summer thunderstorm would become a commercial possibility that would attract the greedy. There would be a scramble then to gather the lightning of every storm before a rival could get ahead of you. Legislation might have to be enacted to protect us from having our chief displays of heavenly fireworks destroyed, much as we have had to pass laws to prevent the destruction of Niagara by the electrical power companies.

Sculpture by Machinery.

Compressed air is being used in the creation of works of art in stone. The pneumatic drill has taken the place of tedious hand carving. An interesting example of this modern process of sculpture is given at the new municipal building, now being erected in Washington, where statues grow as though by magic under the rapid action of the air drill.

The only hand work on these figures, which are to serve for decorating the new building, is done in chiseling the rough form out of the big marble block. The carver begins his work by chipping roughly at the stone until a sort of outline is obtained, and then he turns on the air, and it does the rest. The carving machine is not only more than 100 percent faster than the hand method, but it is said that the results possible with it are vastly superior as well. The delicate features of the face and the intricacies of drapery are obtained more satisfactorily by its use. The machine is fitted with a handle by which the sculptor

manipulates his machine with the precision of a steel engraver at work upon a die. The apparatus is connected by a line of hose with a compressed air pump in the power house, and more than twenty of these machines are in use on the art decorations.

Milk Bottles of Paper.

The latest use for paper is to employ it in the manufacture of pails and bottles for milk. They are simple contrivances, twelve times lighter than the ordinary milk can, but nevertheless of very strong manufacture, and promise to aid in solving the vexed question of the pure milk supply, as they are finished off after having been made waterproof by being sterilized in a furnace heated to 500 degrees F. They are to be used but once. They are more sanitary than the metal or glass cans and bottles that are often not thoroughly washed, and are very cheap. This new use for paper, however, means another demand for wood pulp, and it is clear that the woodlands will suffer from this new industry.

Old Paper.

The paper from which you read the news this morning may be the same on which you wrote a commercial letter, last year. Old paper, even old printed paper, and paper cuttings, have now—in the scarcity of raw materials—assumed an important place in paper manufacture. Paper is used over and over again, until cellulose fibers become so broken that they can not form a web. So true is this that large establishments exist exclusively for the purpose of sorting paper, and many middlemen are employed in handling paper scraps.

The main difficulty in using old newspapers lies in the inks, which interferes with the quality of the pulp. The indelibility of printing ink is proverbial, and it cannot be removed without disintegrating the paper. It can, however, be removed after that disintegration, when agents are employed to dissolve the pigment.

The first step in the process is to tear up the waste paper, and disintegrate it. The resulting pulp is passed through a sieve, and it will be found that while the fiber remains on the sieve almost entirely—a fine sieve of course being used—a large part of the pigment which has been mechanically loosened from the fiber passes through, together with much of the binding vehicle and nearly all of the weighting and filling bodies present in the original paper. This much facilitates the subsequent treatment, as the pulp from the sieve is already freed from ink and other foreign bodies. The pulp is then treated with a solution, sometimes of soap, and afterwards rinsed. It is important to work the process throughout without artificial heat, especially when it is a question of cheap printing inks made from rosin oil. Heat would induce oxidation of the vehicle, and enable it to resist the solvent action of the soap. Sometimes fiber is lost during the passage through the sieve, and a second sieve is used below it, both as fine as possible, to save waste. The above process is necessary only when lampblack ink is employed. Many of the colored printing inks now in vogue are easily destroyed by bleaching agents without any injury to the paper fiber.

Perhaps the most novel of the recent processes for utilizing old paper consists in making it into insulating boards or slabs. Experiment has shown that the ordinary printed sheets of newspapers, because of the inks contained therein, offer a much better foundation for binders than ordinary unprinted paper, and can be made to more closely adhere with less binding than plain sheets of paper. George Kelly, of Hinsdale, Ill., has taken advantage of this fact to make insulating slabs. A number of sheets of old paper are dampened with a solution of borax and water, in order to soften the inks and prepare a suitable foundation for the adhesive. The moistened sheets are then coated with a binding agent, such as liquid glass mixed with sulphur and rubber, or liquid glass alone. The sheets are pressed closely together, and the result is a strong and durable article that has excellent insulating qualities.

It is well known that printers' inks are made up of a fat or grease combined with carbon and the like. Experience has demonstrated that the alkali applied to the sheets not only softens and spreads the ink, but cuts the grease, so that the remaining ingredients produce an excellent foundation, and the silicate of sodium or liquid glass, will adhere more successfully. It has also been shown that a very much less amount of the binding agent is required in securing these printed sheets than in securing plain sheets. The slab or board produced is particularly useful for electrical insulating purposes, but can be employed in other relations. As old newspapers are waste material, they can be obtained at very small cost, and being of substantially uniform size, the necessity and expense of first cutting them is eliminated.

Grease Makes Iron Float.

It is a singular fact that if a small rod of iron, a straight piece of wire for instance, is greased, it can be made to float on water. The grease apparently prevents the breaking of the surface of the water, and the iron lies cradled in a slight depression, or trough.

Recently one of the Governments' scientists at Washington, experimenting with rods and rings of iron, tin, copper, brass, platinum, aluminum, German silver, etc., found that all metals, even the densest, will float on water when their surfaces are chemically clean. A perfectly clean piece of copper, for instance, forms a trough for itself on water just as if it were greased. The official believes the floating is due to a film of air condensed on the surface of the metal, because if a rod is heated to redness and placed on water as soon as it cools, it will sink; but if it is exposed to the air for a short time, it will float.

The Development of Engineering.

Extracts from an address before the last meeting of the British Association for the Advancement of Science.

By S. P. Thompson.

We live in an age when the development of the material resources of civilization is progressing at a rate without parallel. International commerce spreads apace. Ocean transport is demanding greater facilities. Steamships of vaster size and swifter speed than any heretofore in use are being built every year. Railways are extending in all outlying parts of the world. The horsecars on our streets are being superseded by electric motors. The manufacture of automobiles has developed into a great industry. Every year sees a larger demand for the raw materials and products out of which the manufacturer in turn produces the articles demanded by our complex modern life. The world uses more steel, more copper, more aluminum, more paper; it requires more coal, more timber, more petroleum. It needs machines that will work faster than the old ones; new fabrics; new foods; new and more powerful means of illumination; new methods of speaking to the ends of the eartb. If the question be asked what it is that has made possible this amazing material progress, but one answer can be given—science. Chemistry, physics, mechanics, mathematics—it is these that have given to man the possibility of organizing this great development; and the profession that has been most potent in applying these branches of science to direct the energies of Nature to the service of man, is that of the engineer.

In engineering, above all other branches of human effort, we are able to trace the close interaction between abstract science and its practical applications. Emphasis is almost always laid upon the influence of the abstract upon the concrete. We are familiar with the example of the immortal Faraday, who deliberately abstained from busying himself with marketable invention arising from his discoveries, excusing himself on the ground that he had no time to spare for money-making. But the reaction upon science of the industrial applications is quite as significant. For while pure science breeds useful inventions, the industrial development of useful inventions fosters the progress of pure science. It was in the quest—the hopeless quest—of the philosopher's stone and the elixir of life that the foundations of the science of chemistry were laid. The invention of photography has given immense assistance to sciences as widely apart as meteorology, ethnology, astronomy, zoology and spectroscopy. Of the laws of heat, men were profoundly ignorant until the invention of the steam engine compelled scientific investigation; and the new science of thermodynamics was born. The magnet had been known for centuries, but the study of it was neglected until the application of it in the mariner's compass gave the incentive for research.

The history of electric telegraphy furnishes a striking example of this reflex influence of industrial applications. No sooner had the telegraph become of importance, than new instruments had to be devised: means of accurate measurement heretofore undreamed of must be found: standards for the comparison of electrical quantities must be created: and the laws governing the operations of electrical systems and apparatus must be investigated and formulated in appropriate mathematical expressions. And as the consequence of the growth of the telegraph industry, mainly at the hands of those interested in submarine work, came about the system of electrical and electro-magnetic units. Lord Rayleigh declared that the invention of the telephone had probably done more than anything else to make electricians understand the principle of self-induction.

This influence of industry upon science, it may be noted, is for the most part entirely helpful. There may be sporadic cases where industrial conditions tend temporarily to check progress by imposing persistency of a particular type of machine or appliance; but the general trend is always to help new developments. The engineering use of steel, for instance, has led to study of the chemistry of the alloys, and in turn to the recent development of metallography. Everything points to a great and rapid advance in this fascinating branch of science at no distant date.

Baths in Slime.

Salt baths, dew baths, air baths, sun baths—the world is familiar with the curative properties of all of these: but Russia has gone a step farther in this line. There are certain salt lakes near Odessa which possess most peculiar qualities, and are said to effect marvelous cures for sufferers from gout, rheumatism, etc. These salt lakes, says our Consul at the above named city, are really nothing more than river estuaries, which have become cut off from the sea by means of a bar which has formed across the entrance. Owing to the great evaporation, the originally merely brackish waters in these lakes attained such high concentration that it was possible to work them for salt. But their peculiar characteristic consisted in the slimy black ooze of which the bottom is formed. This is made up of impalpably fine mineral matter mixed with the ultimate results of the decomposition of quite a wonderful flora and fauna, apparently only present in the salt water of these lakes, but not in that of the sea. The death of innumerable generations of these animal and vegetable organisms was occasioned by the alternate changes in the concentration of the brine, which was either rendered too fresh for them by the small rivers discharging into the lakes, or which became too salt, owing to the extraordinary evaporation. Dying they sank to the bottom and were covered by particles of mineral matter brought down by the rivers, which flow over a fine-grained loess soil. Lying under the highly salt water of the lakes, the two constituent parts underwent that joint alteration which terminated in the formation of the black slime whicb possesses such singular properties in the cure of disease.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies $1.50.—Please give correct data in ordering.—Address,

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Type-writing machine.....A. Fuhlendorf et al
Type-writing machine.....H. S. McCormack
Type-writing machine.....A. T. Brown
Umbrella.....W. A. Moore
Umbrella or other portable articles, Name-holder for.....W. N. Reynolds
Union suit.....J. E. Richards
Universal joint.....C. A. Brewer
Valve for internal-combustion engines, Mixing-.....J. J. Power
Valve, Check-.....A. Eisenreich
Valve for steam-engines, Reversing-.....J. Gardner
Valve-operating mechanism.....W. B. Jackson
Valve, Pressure-regulating.....S. Ybarra
Valve, Safety-.....S. Densmore et al
Valve, Stop-.....J. Hopkinson et al
Valves, &c., Operating mechanism for radiator-.....W. H. Pearce
Vapor apparatus, Starting device for mercury.....O. O. Kruh
Vapor-burner, Incandescent..A Blanchard et al
Vault-light.....C. H. Paschall
Vegetable-cutter.....M. S. Locke
Vehicle-brake.....H. M. Vanderbilt
Vehicle-brake, Automatic.....J. Stevens
Vehicle, Electrically-driven.....W. B. Potter
Vehicle, Electrically-propelled.....J. Ledwinka
Vehicle, Motor-.....R. Huff
Vehicle-wheel.....M. L. Williams
Vehicle-wheel, Flexible metallic....G. Auberlin
Vehicles, Odometer mounting and lock for.....A. J. Smith
Vehicles, Stalk-cutting attachment for.....R. B. Human
Vending-machine, Coin-controlled.....W. H. Lever et al
Vending-machines, Fraud-preventative device for.....H. J. Wissing
Ventilator.....M. Dorn
Vessel, Turret or similar.....C. D. Doxford
Virometer.....C. L. Dobrick
Vise, Hand-.....W. Kuss
Vise, Pedally-operated.....H. E. Fuller
Voltage and power factor of generators operating in multiple, Means for automatically controlling.....J. Pearson
Wagon, Dump-.....G. A. Post
Wagon, Dump-.....H. F. Langreder
Wagon racks and boxes, Fixture for.....W. Louden
Wagons, Device for loading and unloading racks from running-gears of...J. H. Abrams
Wall-bracket.....G. F. Swortfiger
Wall, Flexible corrugated.....W. M. Fulton
Warp-thread-detecting device.....W. Gross
Washboard.....G. Mittinger, Jr.
Washer-making machine.....H. C. Hart
Washing-machine.....W. F. Blake
Washing-machine.....F. W. Kranz
Water-closet seat.....J. Morrison
Water-color for ceilings and the like.....A. C. Anderson
Water-heater, Electric.....O. Johnson
Water-purifier, Electric.....J. F. Lester
Water-wheel.....G. S. Stevenson
Water-wheel governor.....J. Pearson
Watering device.....A. G. Leonard
Weather-strip.....I. L. Hall
Weed-cutting and root-destroying device.....J. Rumpel
Well attachment, Tubular and drive.....G. W. Stancliff
Wheel.....J. Kennedy
Wheelbarrow.....B. S. Gie et al
Wheel-tread, Jointed.....L. T. Knowles
Wind-gage and elevator, Combined.....W. J. C. Downey
Wind-shield.....C. F. Brandt et al
Window-cleaner.....O. Caesar
Window-frame.....A. Y. Lee
Window-frame.....O. F. Mann
Wire-bound box.....J. J. Miller
Wire coiling and weaving machine..W. J. Pine
Wire furniture.....W. H. Thomson
Wire shaft, Flexible.....H. W. Webb
Wire shafts, Making flexible.....H. W. Webb
Wire stay.....J. A Staples
Wire-stretcher.....P. F. Louy
Wire-twisting machine.....L. Swank
Woodworking-clamp.....J. H. Lane
Wrench.....J. A. Jackson
Wrench.....H. N. Rothweiler

DESIGNS

Belt-clasp.....F. E. Mann
Belt-shield.....F. E. Mann
Comb, Back.....F. E. Mann
Dish, Covered.....A. Parautaud
Game-board.....W. B. Clark
Hat-pin.....F. E. Mann
Match-box.....G. W. Battles
Stick-pin.....F. E. Mann

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MECHANICAL PATENTS.

Abrasive Material, Manufacture of..F. J. Tone
Addressing-machine.....B. S. Molyneux
Advertising and other air-ship....J. C. Burnell
Advertising device.....W. D. Butt
Aerial apparatus.....C. J. A. Fiesse
Air-shield.....J. H. Koons
Air-ship.....J. C. Sandrik
Air-ship.....G. Bold
Alcoholic liquid, Rectifying of...E. Guillaume
Aluminum nitrids, Producing.....O. Serpek
Amusement apparatus.....J. Henzi
Amusement device.....F. Johnson
Amusement device.....J. De la Mar
Animal-trap.....W. Z. Pierce
Arsenoarylglycin.....P. Ehrlich et al
Automobile-gearing.....L. V. Lochner
Auxiliary heater.....W. C. Richman
Awning-operator, Electric...E. U. Giovannoni
Axle, Cast-iron.....E. R. Robinson
Axle-lubricating device.....M. H. Elliott
Balancer set.....R. W. Douglass
Bale tie, Cotton-.....W. C. Ragsdale
Ball-and-socket joint for pipe connections....J. H. Windemuller
Barometer.....B. Junquera
Barrel, Collapsible.....D. B. Jones
Barrel-cover.....D. U. McKeen
Bearing, Flexible.....W. C. Hartmann
Bearings, Retainer for ball-.....E. Sachs
Bed.....W. M. Shaw
Bed-bottom.....J. W. Efaw
Bed-bottom, Spring.....J. G. Venable, Sr.
Bed, Sofa-.....J. B. Strand et al
Beer, &c., cooler.....E. Neely
Beet-topping machine.....A. R. Stevens
Bell-ringer, Electric.....G. Macloskie
Belt for stackers, self-feeders, and the like....J. Lamuth
Belt-tightener.....W. B. Parrish
Binder, Spring-.....J. W. Stockwell
Blacking for heated iron.....G. H. Johnson
Blasting-tool.....L. K. Kramer
Bobbinet, Filling up holes in damaged.....C. A. Christinger
Boiler-furnace.....I. H. Boyer
Boiler furnace, Steam-.....W. Hentschel
Boiler-tube-cleaning device....W. A. Greenlaw
Boilers, Mud-drum for.....J. Stroope
Boll-weevil, Machine for destroying the cotton.....W. W. and W. W. Burson
Book, Check-.....L. C. Reeder
Book, Loose-leaf.....F. W. Hodges
Book-support, Revolving.....J. M. Glass
Boot and shoe.....T. J. Regan
Bootjack.....A. E. Davis
Bottle.....F. J. Colmus
Bottle and closure therefor.....N. P. Jensen
Bottle cap or closure.....B. Adriance
Bottle-closures, Apparatus for the manufacture of.....W. H. Wheeler
Bottle, Non-refillable.....F. L. O. Wadsworth
Bottles and other receptacles, Closure for....A. Gilliard
Bottles and the like, Machine for making closures for.....W. Painter
Box-spring.....J. M. Bowers et al
Bracelet and neck-chain.....F. P. Barney
Brewing soy, Apparatus for.....T. Suzuki
Brooder.....E. M. Wallace
Brush, Gin-.....T. C. Eberhardt
Brush, Rotary.....M. Stoerr et al
Brush, Tooth-.....V. C. Bell
Bucket, Clam-shell.....H. E. Huntsbery
Burners, Means for regulating the supply of fuel to.....H. Lemp
Bushing for casks, Bung-.....H. Reisner
Butter, Making.....G. V. Frye et al
Buttonhole pieces, Apparatus for attaching stay-cords to.....M. C. Thayer
Cabinet, Kitchen-.....A. E. Bonesteel
Cabinet, Physician's.....C. H. Lind
Cable-support and wire-clip, Combined.....F. D. Ogden
Cable-transporter..J. R. and J. Temperley et al
Cake-pan.....F. O. Michelson
Calculating-machine.....W. P. Quentell
Call, Automatic class-.....J. E. Hughes
Camera attachment.....W. E. Phillips
Can-body machine.....J. C. Strickler
Can-cleaner.....K. Hagen
Candy-pulling machine.....J. L. Causey
Car.....E. S. Bucknam
Car-controlling device.....T. Bodde
Car-controlling device, Automatic....T. Bodde
Car, Convertible railway-...M. P. Henvis et al
Car-coupling.....I. Sparks
Car door, Grain-.....W. S. Driskell
Car door, Grain-.....F. L. Thompson
Car draft and buffing rigging, Railway-.....R. D. Gallagher, Jr.
Car, Dump-, 2 pats.....T. R. McKnight
Car-fender.....E. and L. Hohn
Car-fender.....G. U. Shultz
Car hauls, Tension device for cable-.....M. Hibbard
Car, Passenger-.....J. H. Herbst et al
Cars, Antifriction side bearing for railway-.....J. F. O'Connor
Carbureter.....C. A. Rader
Carhureter for hydrocarbon-engines..R. Odell
Card-case.....F. Moonert et al
Carriage-cushioning device.....M. Wolf
Carton.....E. Moore
Cartridge-sizing machine.....H. J. Hurd
Casement or folding window.A. F. H. Hamann
Caster.....E. Sabo
Caster.....L. B. Legge
Casting-rod.....M. A. Beck
Cement-mixer.....A. J. Remley
Centrifugal machine.....C. Duemer
Centrifugal separator.....P. F. Peck
Chair attachment, Rocking-, 2 pats.....M. C. Clemons
Chandelier, Extensible.....W. I. Wilson
Check holder and cutter, Cash-..A. D. Joslin
Churn.....C. L. Heisler
Churn.....G. A. Thompson
Chute.....S. W. Brown
Cigar bundling-ribbon.....W. Brandstaedter
Cigar, Trick.....J. Bing
Cigarette-tipping machine, Individual-.....A. Boucher
Clinometer.....J. D. Keith et al
Clock-movement.....G. Sylvan et al
Cloth shrinking and drying machine.....W. G. Gottschall
Clutch.....L. E. Fuller
Clutch, Friction-.....F. Lucas
Clutch or brake.....J. A. Dixon
Coke and gas, Apparatus for the manufacture of.....J. Armstrong
Collar, Horse-.....J. F. Conniff
Collodion filaments, Apparatus for the manufacture of.....V. Planchon
Column.....I. W. Numan
Compressor or blower.....R. J. McCarty
Concentrator, Dry.....B. C. Gillette
Concrete-block mold.....B. A. Fuller et al
Concrete-block mold, Hollow-....L. S. Johnson
Concrete-mixer.....A. E. Schenck
Concrete-mixer, 2 pats.....G. J. Stafford
Condensing fumes and gases, Apparatus for..G. C. Richards
Conductor, System for selecting one of several receivers connected to a common..A. Franke
Confectionery-holder.....C. E. Greene
Conveyer, Adjustable screw.....C. Brent
Cooker, Steam-.....J. E. Prater et al
Core-making apparatus, Sand-....W. D. Berry
Core-making apparatus, Tubular sand-.....W. D. Berry
Corn, Storage device for seed-...C. J. Ostrum

Corset-shield....A. Hill
Cotton-chopper....S. Truitt
Cotton cleaner, feeder, and separator elevator....E. A. Carmouche
Cotton-cleaning machine....J. M. Gardner
Cotton-picking machine, Portable....W. H. Niemeyer
Counting-board....T. S. Ford
Crane mechanism....D. Kendall
Cultivator-fender....A. B. Nichols
Curling-iron, Electrical....T. M. Caven
Current-collector, Sliding....A. H. Armstrong
Cycle, Motor-....W. G. Schaeffer
Dampening-machine....D. H. Benjamin
Dental crown-heater....E. W. Dodez
Dental dam-holder....C. A. Conover
Diamond, Imitation....J. C. McDearmon
Dielectric separator....H. M. Sutton et al
Display apparatus for rugs and the like....M. D. Howell
Display-cabinet....J. Waugh
Door fastener, Sliding-....F. Rasmussen
Door fastener, Sliding-....C. A. Moline
Door-operating mechanism, Dumping-....S. Otis
Doors, shutters, gates, and the like, Closer for....C. Trude
Dowel and rivet marker....H. L. Wood
Draft and huffing rigging..R. D. Gallagher, Jr.
Drafting instrument, Garment-pattern-....G. V. Valentine
Drawers....M. Galland
Drawing perspective views, Apparatus for....E. Meyer
Drilling-machine....B. F. Barnes
Drum....A. D. Converse
Drying apparatus, Vacuum....E. Passburg
Dumping device, Automatic....J. W. Weaver
Dye, Blue disazo....C. Ris et al
Dynamometer....J. B. Wehh
Ear, Instrument for medicating the middle....J. A. Gault
Ear-trumpet....G. W. Cline
Easel....F. M. Carr
Electric condenser....M. O. Troy
Electric currents, Automatic cut-off for....D. C. Cañizares
Electric distribution system, Monocyclic....C. P. Steinmetz
Electric heater....C. L. Taylor
Electric heater....H. Wahlquist
Electric heater and cooker....E. M. Crandall
Electric lock....S. W. Wihel et al
Electrical contact....R. F. LeBrocq
Electroplating apparatus....C. E. De Long
Electroplating apparatus, 2 pats....J. T. Daniels
Electroplating apparatus....W. R. King
End-gate, Wagon....B. M. Wilhite
Engine....F. A. Sharpneck
Engine and tender coupling, Locomotive....P. M. Holdsworth
Engine igniter mechanism, Internal-comhustion-....E. Ruud et al
Engine safety starting device, Explosive-....C. P. Cary
Engine starter, Comhustion-....L. W. Coppock
Engine starting means, Internal-comhustion-..G. Enrico
Engine starting mechanism, Explosive-....H. C. Fricke et al
Engines, Deodorizer for internal-combustion..W. R. C. Wakley et al
Evaporating apparatus....J. A. Just
Excavating apparatus....W. C. Weeks
Explosive-engine....H. D. Baird
Explosive-engine, 2 pats....H. O. Westendarp
Extrusion-machine....G. H. Benjamin
Eyeglass-guard....L. F. Adt
Eyeglass-mounting....L. F. Adt
Eyeglass nose-guard, 2 pats....L. F. Adt
Eyeglasses, 3 pats....L. F. Adt
Eyeglasses....W. H. Weaser
Fabrics, Apparatus for crimping and gathering the ends of tubular....S. Cohn
Fan....I. A. Youngherg
Fan-motor, Oscillating....H. R. Wellman
Faucets, stop-cocks, &c., Safety device for....C. A. Maniex
Feed-hag, Animal....M. E. Keller
Feed-cutter....E. S. Wilder
Feeder and waterer, Poultry....M. Kuettner
Feeding device, Frictionally-controlled....F. O. Lawrence
Feeding mechanism....G. Wagner
Fence-stretching apparatus....J. W. Mason
Fertilizer, Insecticide-....F. G. Dokkenwadel
Fertilizer, Making a....E. Collett
Fertilizers, filtering materials, and the like, Production of....J. Brightmore
Fiber-cleaning machine....H. L. Vaughan
Filtering apparatus, Liquid....C. Pauthonier
Firearm....A. Fyrberg
Firearm, Repeating....M. Hepburn
Fish hait or lure....H. W. Buschemeyer
Fishing-rod....J. W. Eshnaur
Flask-clamp....R. E. Munn
Flue-expander, Pneumatic....H. Kelly
Fluid-pressure brake....W. V. Turner
Fluids, Apparatus for intimately mixing liquid and gaseous....P. Kestner
Folding-machine, Cement-applying....F. S. Jennings
Friction transmission mechanism....B. G. Pfeiffer
Fruit-cutter....H. All
Fruit grading or assorting machine..R. Strain
Fruit separating or assorting machine....J. H. Urquhart
Fruits and other produce, Appliance for use in storing fresh....F. W. Meakin
Frying-pan....J. Csincsak
Furnace....J. D. F. Andrews
Fuse....E. Schattner
Game apparatus....J. H. Lee
Game apparatus....E. M. Perfect
Garden-implement....W. C. Doidge
Garment-hook....L. B. Huntington
Garment-supporter....G. M. Morgan
Garment-supporter....L. H. Brooks
Garment-supporter clasp....G. E. Mellen
Gas apparatus, Producer-....H. F. Smith
Gas-hurners, Valve for....H. S. Humphrey
Gas-furnace for chain-link welding or the like....R. Müller
Gas-lighter, Electric....R. A. Rockwood
Gas, Making producer-....E. P. Snowden
Gas-producer....E. P. Snowden
Gas-producer, Maintaining a constant or approximately constant temperature in a....E. Capitaine
Gas, Producing....G. J. Weher
Gate....A. J. Shrope
Gate....T. E. West
Gearing, Friction-....J. K. Cochran
Girder-frame for reinforced-concrete girders, Steel....E. N. and R. E. Spaulding
Glove....G. N. Gitt
Go-cart, Folding....C. H. Smith
Gonorrhea, Instrument for treating....J. A. Gault
Governor....A. Dickerson
Governor....F. W. Salmon
Grain and other granular or pulverulent materials, Apparatus for elevating....L. G. and H. J. Rohde
Grain-distrihuting devices, Position-indicator for....H. B. Higgins
Grain from smut or other fungi, Purifying..F. Mears
Granular or pulverulent materials, Receptacle for....A. J. Blood
Grate attachment....E. W. Jeter
Grindstone-frame, Folding....D. I. Sterling
Guy-clamp....F. B. Cook
Hair-pin....G. W. Whitney
Halter....J. Spangenherg
Hame and trace connector....W. C. Trask
Hammer, Pneumatic....G. S. Wallin
Hammer, Power-....G. E. Davis
Hand-hole closure....H. G. Oshorne
Harrow and land-roller, Comhined disk....L. L. Jackson
Harvester, Corn-....R. Rohinson
Harvesting machine, Corn-....P. Suhr
Hasp-fastener....G. M. Hughes
Hats, Manufacture of....H. L. Stevens
Hay-press....V. Biela
Heater....W. H. Burk
Heater and drier....H. W. Ash
Heating device, Electric..W. S. Andrews et al
Heating-furnace....W. T. Stewart
Heating or cooling apparatus....J. Heizmann
Heel-plate....H. J. Griswold
Hinge....H. P. Squiers et al
Hinge for scale and wagon racks, Combination-....C. W. Worthington
Hoeing-machine....W. A. Harris
Hog-scalder and feed-cooker....J. T. Roberts
Hog-trap....G. W. Halley
Horseshoe-calk....J. F. Borgelt
Horseshoe calking and welding apparatus....A. T. McCreary
Horseshoe-pad....J. H. Moore
Hose and pipe coupling....M. C. Steese
Hose-coupling....T. H. Harrington
Hose-coupling....F. O. Guth
Hub, Wheel-....H. J. Lawrence
Hydrocarhon-burner....F. G. Schmidt
Hydrocarbon-vapor burner....T. J. Cornish
Illusion apparatus....H. R. Law
Incuhator-heating device....E. M. Wallace
Indigo, Making monohromo....G. Engi
Ingot-stripper, 2 pats....R. S. Kirk
Insulator....H. Trumhull
Insulator....H. Friend
Insulator and lamp-hanger, Comhined....J. M. Burge
Insulator, Third-rail....L. H. Delloye
Insulators, Means for attaching line-wires to....C. J. Elliott
Irrigating system....C. Bevill
Irrigating system....J. E. Bishop
Jack....L. G. Maitland
Jaws, Device for repairing fractured....P. Stukey
Jewelry....F. P. Barney
Journal-hearing....G. Küpfer
Journal-box guard or closure....G. F. Godley
Kitchen, Portable field-....L. Höhnke
Kitchen-rack....B. L. Bailey
Knoh attachment....G. Cooper
Labeling-machine....H. M. A. Harders
Lace-hook....G. T. Houghland
Ladder....A. S. Asch
Lamp-burner....A. H. Handlan, Jr.
Lamp, Incandescent electric....M. D. Jones
Lamp sockets, Adapter for incandescent-....M. M. Wood
Lamp Tuhular....C. L. Betts
Lamps and lanterns, Burner-fastening for....E. C. Everett et al
Lantern, Projection-....C. F. Dutton, Jr.
Lantern, Signal-....G. H. Rolfes
Last-demonstrator....E. A. Eastman
Last, Hinged....C. F. Pym
Latch....W. E. Sparks
Latch, Refrigerator-....C. Stotz
Lightning-arrester....E. S. Halsey
Lime, Manufacture of chlorinated compounds of....H. Schultze
Lincmen's climbers, Safety attachment for....J. D. O'Connell
Linotype-machine, 2 pats....D. S. Kennedy
Linotype-machine....T. S. Homans
Liquid-atomizing apparatus....P. Kestner
Liquids, Centrifugal fan or machine for atomizing....P. Kestner
Liquids in centrifugal fans or drums, Distrihution of....P. Kestner
Lock....H. F. Keil
Locomotive speed-recorder....J. Livtschak
Logging-machine....E. D. Swan
Logs, Choker-hook for hauling....C. and R. Colfelt
Loom, Automatic-replenishing....W. I. Stimpson et al
Loom filling-replenishing mechanism....G. O. Draper
Loom-shuttle....C. H. Carr
Looms, Automatic stop-motion mechanism for power....F. Blumer
Looms, Thin-place-detector-releasing means for....A. E. Rhoades
Luhricating device....L. S. Watres
Lumber, Artificial....K. Hengerer
Magnet winding, Field-....J. A. Stratton
Mail-hag catcher and crane....T. Rogers et al
Mail-bag catcher and deliverer....H. H. Akers
Mail-bag catching and delivering apparatus....G. A. White et al
Mail-bag delivering and catching device....J. H. Whitaker
Mail-bag receiving and delivering apparatus..H. J. Hedrick
Mail-crane....F. B. Reed
Manure-spreader....C. W. West
Match-box....E. J. Anderson
Match-box....E. J. Hawkins
Match-safe....G. Harris
Measure, Computing yard-....C. O. Gammon
Measuring the heights of persons, Coin-controlled machine for....W. B. Bartram
Mechanical movement....A. H. Neureuther
Merry-go-round, Free-carriage...J. De la Mar
Metal wool, 2 pats....A. Shedlock
Metal wool and fiher mixture....A. Shedlock
Metallurgical furnace....W. S. Demsey
Mica-trimmer....E. G. Shepherd
Milk, Condensing....J. A. Just
Milk cooler and aerator....C. Skidd
Milk, Producing dried....J. A. Just
Milling-tool....B. Wonderly
Mines, System for ventilation of....W. E. Elliott et al
Miter-box....C. Solemslic
Moistening device for stamps, labels, and stickers....J. T. Rider
Molding apparatus, Sand....W. D. Berry
Molding-machine....A. T. Drysdale
Molding-machine....W. Welsh
Molding-machine....J. A. Lefferts et al
Molding, &c., with metal, Casing wooden....A. Beyrle
Motor controlling means, Electric-....H. W. Leonard
Music-ladder for teaching notes, Mechanical....L. A. Jaros
Music-roll-marking device....P. Wuest, Jr.
Musical instrument, Stringed....C. S. Weher
Musical instruments, Adjustable support for music-rolls for automatic....C. Freborg
Musical instruments, Balanced swell for....S. W. Clark
Musical instruments, Pedal-actuated stop mechanism for....R. S. Hill
Nail-inserting machine....W. H. Taylor
Needle-separator, Detachahle....F. F. Witkus
Nose-guard, Adjustahle....L. F. Adt
Nut, Lock-....O. Thomas et al
Ore-concentrator....G. T. Cooley
Oscillation-rceceiver....G. W. Pickard
Oven....G. R. Moon
Oven, Bake-....G. Repp
Oven-carriers, Actuating mechanism for....A. Mill et al
Oyster-carrier....R. C. Bender
Package and hanger for garments, Combined shipping-....M. M. Strauss
Packing and wiping waste....M. Samuel
Pan....A. E. Grochau
Paper-box machine....F. E. Kuster
Paper serving or distributing device....M. Ehrlich
Paper-tube-perforating machine....J. Gohy
Papering machine, Wall-....G. M. Charron
Pen filler, Fountain-....H. N. Carpenter
Percentage-table, Tax-assessor's....S. F. and B. B. Kennedy
Permutation-lock....D. Churchill
Phonograph repeating attachment....J. H. Stinson
Phonograph-reproducer....J. T. Mygind
Photography....H. L. Reckard
Phototelegraph, Automatic....A. Korn
Piano....E. E. Walter
Piano, Automatic....R. B. Fowler
Piano-frames, Capo-tasto bar for....C. C. Chickering
Piano-hammers, Means for repairing the felted heads of....R. R. Bodé
Piano-keyboard....F. Kuha
Pianos, Divided action for....T. Danquard
Pianos, Pressure device for the strings of....W. D. Sumlin
Pianos, Self-playing attachment for....G. H. Davis
Picture and stovepipe holder, Combined....A. Mantenfel
Picture-frame, Extensible....J. A. and A. W. Watt
Picture-molding hracket....J. G. Peterson
Pictures, Apparatus for viewing panoramic....A. Hattu
Pie-pan....B. C. Sahin
Piling, Metal....J. J. Harold
Piling, Metal sheet-....R. B. Woodworth
Pipe coupling, Automatic train-....N. F. Niederlander
Pipe coupling, Train-....E. B. Witte
Pipe-couplings, Middle ring for..F. N. Smith
Piston....J. E. Thompson
Plastic material into charges, Machine for dividing....C. A. Thomson
Plow....J. H. Moore
Plow, Rotary....J. E. Liebhart
Plow, Sulky-....G. W. Jessup
Plug, Duplex testing-....T. Deasy
Pneumatic drill....M. Hardsocg
Pole and shaft for vehicles, Combined....A. J. Martin
Pole, Tent-....C. A. Bateman
Poles, piles, and posts from decay, Means for protecting....E. B. Harang
Pool-table attachment....P. F. McAuley
Potato-masher and spoon, Comhined....H. J. Griswold
Powder holder, Tooth-....P. S. Hay
Power-transmission mechanism....N. Ruland
Power-transmitting mechanism....J. E. Tuttle
Primary battery....C. B. Schoenmehl
Printing-machine....S. Brown
Printing machinery for simultaneous multi-color-printing, Rotary web-..F. von Eulenfeld
Printing press, Multicolor-....H. F. Bechman
Projection apparatus, Dissolving attachment for....W. L. Patterson
Propeller, Steering-....H. L. Ward
Propelling apparatus, Vessel-....A. Ahlhrecht
Propelling machinery, Vessel-....G. Delén
Proportional meter....E. E. Clark
Protective device....K. Kuhlmann
Pulley....T. A. Jones
Pulp-flow-box shower device..G. H. Blanchard
Pulverizing or grinding mill..J. W. Fuller, Jr.
Pump....F. H. Whitcomb
Pump....P. Yver
Pump and turbine, Centrifugal..E. S. G. Rees
Pumping apparatus, Oil-well....G. L. Cusac
Punching and spacing machine..M. M. Beasley
Push-button switch....P. A. Paul
Radiator, Heat-....S. D. Woods et al
Rail clamp, Guard-....W. B. Cooke
Rail-joint....W. H. Grosse
Rail-spike supporter and protector..J. [illegible]
Rail, Track-....R. H. [illegible]
Railway-frog....E. N. [illegible]
Railway frog or crossing..C. W. Reinhardt et al
Railway, Pleasure-....J. F. Morris et al
Railway-rail joint....W. E. [illegible]
Railway switch-operating mechanism, Electrically-controlled....K. W. G. J. Storcks et al
Railway-switch-throwing device...E. N. Strom
Railway system, Electric-....S. C. Frey
Railway system, Third-rail electric-....C. Kozmik
Railway-tie....J. A. Sharpe
Railway-tie....J. B. Dewhirst
Railway-tie....S. H. Dodd
Railway-tie and rail-fastening device....J. J. O'Donnell
Railways, Double-necked rail for...J. A. Myers
Ratchet-wrench....A. J. Campbell
Razor....A. Kaster
Rock-drilling machine....H. Hellman et al
Rocking-chair....A. H. Ordway
Rollers, Dust-guard for....E. J. Muth
Rotary engine....W. J. Tekippe
Rotary engine....T. J. Quirk
Rotary engine....J. Scipe
Rotary engine....J. P. Fox
Rotary engine....J. W. Mooney
Rotary reaction-motor....G. W. Barber, Sr.
Rubber dam and tooth-backing punch, Comhined....H. M. Bell
Ruhher overshoe, Low-cut or sole..F. C. Hood
Ruhher shoe holding device....F. P. McAulay
Rug-rack....W. F. Judd
Sad-iron, Electrically-heated....F. Kuhn
Safe-jacket, Burglar-proof..J. W. Vaughan et al
Salt-shaker....A. Cohencius
Sash-fastener, 2 pats....A. Van Duzer
Sash, Window-....E. W. Selkirk
Sausage-stuffer spout....W. J. Bussinger
Saw-handle....E. A. Patterson et al
Scale, Automatic weighing-....C. L. Bond
Scale-indicators, Attachment for..B. E. Butler
Scow....J. H. Gerrish
Sculptor's reproducing-machine....J. B. Salo
Seal....C. Barbieri
Seal....J. C. Davis
Sealing envelops and affixing stamps thereto, Means for....A. M. Moylan et al
Seaming machine for cans, Douhle-....C. J. Rhodes
Seat-frame....E. G. Budd
Seat or stool....H. Sutton
Seed-grading machine, Cotton-..J. W. Conner
Seeders or grain-drills, Cover-retaining mechanism for hoppers of....N. R. Nelson
Sewing machine, Shoe-....I. T. McIsaacs
Sewing machine, Shoe-....E. E. Winkley
Shade and curtain hracket, Window....S. R. Seybold
Shaft and pole, Combined vehicle....C. Acker et al
Shaft, Vehicle-....S. G. Gay
Sharpener, Drill-steel....J. Sopp
Sharpening machine, Knife-....P. Behrens
Shaving device, Safety....O. Kampfe
Sheet-feeding mechanism....L. E. Morrison
Ship-elevating apparatus....K. Löhle
Shock-ahsorber....D. M. Davis
Shoe-polishing device....S. W. Sims
Shoe-protector....A. P. Beck et al
Shovel-tooth....J. A. Parsons
Shovel tooth, Excavating-....F. J. Thomas
Shovel tooth, Excavating-, 2 pats....J. M. Sherrerd
Shruhhery-cutter....C. Berg
Sieve-cleaner....E. Knips
Sifter-box....G. W. Rowe
Sign-displaying device....Z. T. and E. Ubil
Sign, Lighted....S. Grimson
Signaling system....G. Bahcock
Sleigh-knee....J. A. Heintz
Smelting ore....A. Steinbart
Snap-fastener....G. A. Holmes
Soap-shaver....J. H. Williams
Soda-fountain....W. A. Sexton
Sound-reproducing machine....L. T. Haile
Spark-arrester....P. M. and C. M. Wickstrum
Speed mechanism, Variahle-....F. G. Gauntt
Spigot and escape-valve, Comhine....R. S. Wiesenfeld
Spinning-machines, Roll-stand for..E. D. Lihhy
Spoke setter and guide....J. Hanon
Spoke-setting machine....E. E. Foxworthy
Sprayer, Color and dye....H. Mikorey
Spraying nozzle, Chemical-....H. Siehen
Spring-fastening....F. Schindewolf
Spring-motor....L. M. and H. F. Kerns
Square and calipers, Comhined....W. Dissell
Square, Miter, try, and hevel....C. M. Justice
Stacker, Hay-....G. L. Curtis
Stacker, Hay-....J. F. Bruhn
Stamping-clip....J. E. Tornquist
Stamping-machine....H. E. Johnson
Stanchion, Cattle-....E. W. Johnson
Stationery-supply case....C. Fraas
Steam-boiler....L. S. Watres
Steam-heater....G. R. Nixon
Steam-tight joint for rotary rods....J. S. Chambers
Steel and like metal, Making articles of manganese....W. G. Nichols
Stitch-separating machine....J. B. Hadaway
Stock-dipping device....W. K. Crapnell
Stove....G. R. Moon
Stove-lid....G. W. Shoemaker
Stove or range, Cooking....C. R. Hanson
Stoves, Means for supplying fuel to....W. Glenk
Strainer, Bluing-....W. E. Grigg
Street-scraper....H. T. Toy
Structure made of bricks for recreation-towers, heat-compensation apparatus, and the like....R. Scherfenherg
Stuffing-hox....A. G. Heggem
Stump-puller....R. B. Barrow
Surgical bandage....M. A. Willot
Swingletree-antirattler....W. Mehn
Swingletree attachment....S. D. Riegel
Switch-hase....W. R. Atkinson
Switch-points, Adjustable connecting-bar for....W. M. Henderson
Switch-stand....E. N. Strom
Table for meat, sausage, and the like....W. B. Affleck
Table-top protector....J. L. McKay
Tabulator....M. C. Mosher
Talking-machine attachment...W. A. Chapman
Talking-machine record....E. R. Johnson

Telegraph, Printing-....C. L. Krum
Telegraphy, Cable....I. Kitsee
Telephone and circuits therefor..E. E. Clement
Telephone instrument....M. Waters
Telephone system....C. W. Sharer
Telephone system, Party-line....T. L. Willson
Thermostat....C. J. Letzing
Throttle....J. W. Kennedy
Tickets, Fraud-detecting device for.... H. C. Busby
Tie-holder....L. K. Sone
Tie-wire clamp....G. Wrigley
Time-recorders, Means for detecting false registration in....J. and A. Dey
Timer....W. W. Robinson
Tire for road-vehicle wheels, Cushion-.... J. Stevens
Tire for the wheels of road-vehicles.... J. V. F. A. Yberty et al
Tire, Pneumatic....H. Musclow et al
Tire-setting machine....M. Smith et al
Tire, Vehicle-....E. B. Cadwell
Tire, Wheel-....F. N. Boughn
Tool-chest handle....T. H. Furman
Tool rest, Turret-....L. H. Vold et al
Toy horn....A. D. Converse
Trace-fastener....J. C. Wood
Track-sanding mechanism....C. P. White
Track-switch, Electrically-operated..F. B. Corey
Transmission device....A. P. Fischer
Trap....W. R. Green
Tree-trimmer....H. J. Lawrence
Trolley-catcher....W. C. Burdon
Trolley-pole....G. W. Chatmond
Trolley-wire-supporting device for bascule-bridges....J. B. Strauss
Trousers stretching and pressing device.... C. A. Beal
Truck, Hand-....F. Lang
Truck, Tongue-....W. Mohr
Trunk-fastener....S. W. Bonsall
Turbine, 2 pats....F. H. Lindner
Turbine, Elastic-fluid....O. O. Storle
Turbine, Elastic-fluid....M. Matthews
Type-writer attachment....J. P. Glore
Type-writer key and type-bar mechanism.... J. Alexander
Type-writing machine....B. C. Stickney
Type-writing machine....F. W. Sickles
Umbrella, Folding....C. Stone
Valve....W. J. Kennedy
Valve and spout, Tank....J. A. Ingalls
Valve, Collector-operating....G. Macloskie
Valve-gear for explosive and internal-combustion engines....F. M. Rites
Valve, Intercepting....G. E. Wilson et al
Valve mechanism for air-compressors.... T. H. Smith
Valve, Slide-....J. Hargreaves
Valves, Bush for....F. T. Fiegehen et al
Vamp-folding machine....H. Lyon
Vaporizer....E. L. Dunning
Vaporizer and burner, Spirit..W. Liedke et al
Vegetable and fruit picker....A. Elmberg
Vehicle-driving mechanism, Motor-.... J. P. Lavinge
Vehicle running-gear....F. R. Owens
Vehicle-seat, Auxiliary....H. A. Schermerhorn
Vehicle-spring....M. M. McIntyre
Vehicles from dust Apparatus for shielding... C. P. Barhy
Vending apparatus....C. H. Kelley
Vending-machine....A. E. Wyatt
Vending-machine, Automatic....L. U. Kent
Veneer-press....C. E. Francis
Vessel, Double-walled....A. Aschenbrenner
Vessel, Marine....G. F. Trishman
Visual signal....W. L. Merrill
Wagon-brake....A. J. Strunk
Wagon, Dumping-....C. M. Haeske
Waits, Skeleton....W. W. Bewsic
Wall and ceiling covering....T. Franke
Wall, Portable partition-....M. Bokor
Ware, Making seamless-hollow.... A. G. Lindenborg
Washboard, Renewable-front....W. G. Frost
Washing apparatus....H. H. Sheard
Washing-machine gearing....L. W. Mammen
Watch-movement fastener....C. Kummer
Water-closet....C. H. Rollins
Water-cooler....F. W. Tuerk
Water-gage....C. A. Kenny
Water-heater....G. W. Morris
Water-heater, Electric....O. H. Fiddes et al
Water-meter....F. C. Bogk et al
Weather-strip....C. E. Wade
Well-drilling machine....J. W. Teetzel
Well-drilling machinery....H. R. Decker
Well-drilling means....J. H. Milligan
Wells, Water-stop for deep....H. J. Newhouse
Wheelbarrow....C. A. Baker
Wheelbarrow-clip....C. A. Baker
Wheelbarrow-trays, Machine for trimming and beading....J. M. Skinner
Wind instrument, Brass....C. G. Conn
Window-chair....J. Wartenberg
Window, Horizontally-pivoted.... G. B. and G. H. Babcock
Window-pane fastener....J. C. Crowson
Window safety ventilating-stop..A. Rosenberg
Wire pot-lid rack or wall-pocket..S. H. Sloan
Woodworking-machine....R. S. Allan
Work-holding attachment....J. Inman
Wrench....A. G. Dickson
Wrench....E. Lachèze
Wrench....E. Lockyer
Writing-machine....E. B. Hess et al

DESIGNS.

Badge....M. Wojtecki
Badge or similar article....W. J. Burnett
Bag, Hand-....J. Stember
Buckle, Belt-....F. E. Mann
Clock-case....L. V. Aronson
Glass vessel or similar article...L. Hinsberger
Jewelry-case....J. R. Sundee
Ring....W. J. Carey

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MECHANICAL PATENTS.

Acid, Making methylthiophenol-ortho-carboxylic .... B. Homolka et al
Acid menthol ester, Brom-valeric-.... E. Spröngerts
Adding-machine....F. Salinger
Advertising hat-clasp....F. T. Sherwin
Aeroplane....F. I. Judson
Air-brake, 2 pats....J. B. Wright
Air-brake....C. E. Shade
Air-brakes, Electrical appliance for controlling .... J. G. and W. H. Pearce
Air-compressor....C. P. Tolman
Aluminum or other metals from their compounds, Winning....H. S. Blackmore
Amalgamator....W. C. Bourdette
Anchor, Ground-....F. Lucas
Animal-shears....W. M. Cahill
Armature-winding for electrical machines.... B. G. Lamme
Ash and match tray, Combined....D. J. Segel
Automobile running-gear....C. T. Pratt
Automobile sled attachment....H. H. Rohlf
Automobile vehicles, Drive and steering gear for....E. P. Cooper
Awning....M. Riley
Baby-tender....R. L. Richardson
Bag-fastener....S. W. Rohn et al
Bag-holder....J. C. Jacoby
Baggage-marker....E. S. Phillips
Bale-tie....L. Alverson et al
Bar-counter box....J. Lehnbeuter et al
Barium, Manufacture of oxycarbid of.... R. Battistoni et al
Basket-cover-making machine....R. B. Fuller
Basket-covers, Machine for making cleats for.. R. B. Fuller
Battery plate, Storage-....T. A. Willard
Bean-puller....M. J. Quinsey
Bearing for driers and screens, End-thrust.... G. L. Preacher
Bearing, Mining-car-wheel-.... W. C. Fownes, Jr., et al
Bearing, Spindle-....T. W. Morgan
Bed, Sofa-....F. Bennett
Bed-spring end rail....G. Holden
Bedstead....A. Calvet
Bell mechanism....W. R. Moore
Bib, Infant's....M. W. Walbridge
Binder, Loose-leaf....J. C. Dawson
Blower, Positive-pressure....J. W. Wilson
Boat, Pleasure-....D. G. Exley
Boilers, Device for supplying scale-removal compounds to....G. W. Case et al
Boot and shoe and innersole therefor.... G. C. Bemis
Bottle....L. Liptai
Bottle cap-closure....G. Koch
Bottle-cap remover....G. A. Brinn
Bottle capper, Cased-....T. L. Valerius
Bottle-capping machine....S. Wilkinson
Bottle-filler....T. L. Valerius
Bottle-filling machine....C. L. Bastian
Bottle, Non-refillable....O. Hachman
Bottle, Non-refillahle....H. W. E. Josling
Bottle-stopper....G. S. Griner
Bottle-stopper....G. Kirkegaard
Bottle-washing machine....W. J. Cunningham
Box top, Powder-....W. H. Perkins
Brace and brace-frame, Flexible corrective.... G. W. Haas
Brake-shoe....F. W. Sargent
Bread-maker's gage....J. Rohesky
Brick-conveyer....W. R. Martin
Bronzing-machine....W. Friess et al
Brush, Dahbing-....P. Henry
Brush-handle....R. Baillargeon
Brush-holder....A. G. Howard
Bucket, Well-....L. B. Thomas
Buckle and thill-carrier, Combination.... O. P. Welding
Building construction with reference to covering material....H. E. Kock
Building, Wooden....J. H. Flickinger
Bundling-press....T. C. Dexter et al
Burial-casket....C. L. Smith
Bushing....G. W. Spencer
Bushing, Bung-....T. Pendergast
Bushings, Making....G. S. Van Voorhis
Butter-cutter....C. P. Ross
Butter fat from fresh milk or cream, Extracting....M. E. Stro
Button, Cuff-....H. C. Ward
Button-fastener....T. R. Hyde, Jr.
Cahinet....W. Person
Cahinet, Bin-....C. F. Kurz
Cahinet, Drawer-....C. F. Kurz
Cahinet, Kitchen-....R. P. Dewey
Cahle tension-reel....J. A. Moser
Cahles, Connecting-conductor for..F. S. Vielé
Caisson....O. C. Edwards, Jr.
Calculating attachment....H. C. Dungan et al
Calipers and dividers....A. F. Henrikson
Can-polishing machine.... Kaeser
Cane, Combination-....W. T. Newsom
Car-coupling....P. Neddo
Car-derailer....R. Hamilton
Car-door-rail hanger....J. M. Hopkins
Car, Dump-....S. Otis
Car-fender....J. A. Rogan
Car-fender, Automatic....H. W. Bodendieck
Car fender, Street-....H. M. Prater et al
Car heating and ventilating apparatus.... E. F. Porter
Car, Railway dump-....T. R. McKnight
Car, Vestibule stock-....W. A. Buckner
Car-window....J. W. Scott
Cars, Adjustable partition for stock-.... G. A. Peters
Cars at drawbridges, Safety device for street-.... J. W. Collins
Carbid, Manufacture of....H. L. Hartenstein
Carbid-manufacturing apparatus.... H. L. Hartenstein
Carbureter....C. R. Greuter
Carbureter and governor for internal-combustion engines, Combined...C. H. McClintock
Carbureter for explosive-motors, Automatic.... L. M. G. Delaunay-Belleville
Carpenter's tool....T. Buehler
Carpet fastener, Stair-....J. L. Kingston
Carpet-stretcher....T. K. Bradbury
Carpet-sweepers, Disinfecting attachment for.. W. L. Plumb
Carving-machine....F. H. Richards
Cash-slip, Refunding....B. F. Seymour, Jr.
Casket-handle....N. L. Barmore
Cesspool....G. W. Schodde
Chain....H. S. Atkinson
Chimney-cowl....D. McLean
Churn and freezer....R. C. Lambie
Chute and draft appliance, Straw-.... F. A. Magwire
Chute, Coal-....F. Leschinski
Cigar....I. Kitsee
Circuit breaker....E. H. Smythe
Circulation....F. P. Dewey
Circulation apparatus....F. P. Dewey
Clamp....J. H. Mills
Clamp-anchor....F. Robinson
Clock repeating mechanism....C. Müller et al
Clod-crusher....E. C. Bandle
Cloth-cutting machine....G. Scott
Clothes-hanger....C. Cook
Clothes press or cabinet....N. Burns
Clutch, Friction-....S. Bramley-Moore
Clutch, Friction-....J. Fuchs
Cobalt and nickel, Separating salts of.... T. B. McGhie
Cock, Gas-....W. E. Holderness et al
Cock, Safety gas-....F. T. Richter
Code message, 2 pats....M. Beardini
Coin-controlled apparatus....M. Elzas
Coin-controlled lock....V. A. Lippert
Colander....A. Kissel
Collapsible box....W. I. Tuttle
Collapsihle box....N. B. Wood
Collapsible box....W. I. Tuttle
Computing-machine....J. T. Uebbing et al
Concrete construction, Reinforced.... R. H. Aiken
Concrete floor and ceiling, Reinforced.... G. M. Graham
Concrete floor construction....F. C. Taxis
Concrete-mixing apparatus....C. B. Dunn
Concrete roof, Reinforced....G. M. Graham
Condensing plant, Steam-....D. B. Morison
Container....F. B. Davidson
Control apparatus, Automatic..J. B. H. Clologe
Controlling and reversing means..C. F. Roper
Convertible chair....G. E. Clapp
Conveyer, Chain....J. Mallon
Cord-grip for mechanical or other fixtures.... J. E. R. Hayes
Cores, Chaplet for....O. Frese et al
Corking-machine....C. Sellenscheidt
Corn and other grain, Degerming Indian.... J. F. Gent
Corn-mill....W. C. and F. D. Meadows
Counter....R. W. and C. B. Vardeman
Counting-register....H. C. Bowlus
Cradle....W. W. Temples
Cranes, Automatic safety device for.... N. S. Haseltine
Crate-filler machine, Egg-....L. J. Smith
Cream-separators, Driving mechanism for centrifugal....T. W. Morgan
Cuff for coats, Detachable....L. Shulman
Culinary supply-card....W. D. Henderson
Cultivator-shovel fastening....R. L. Morris
Curling or crimping tongs....V. Wex
Cutter bar and guard....C. G. Hampton
Cyanids, Making, 2 pats....H. S. Blackmore
Darning device....G. H. Crawford
Decorticator....W. L. Weber
Dental cement and manufacturing the same.... F. L. and G. L. Grier
Dental plugger....A. Atkiss et al
Dental swaging apparatus....H. W. Allwine
Desk implement, Combination....J. S. Rapson
Desk, Table-....W. C. Miles
Dish-drainer....D. P. Zondervan
Display-stand....O. P. Lively
Distilling apparatus....P. Asher
Distilling apparatus....T. M. U. von Post
Door-closing apparatus, Automatic.... E. Zöpfchen et al
Door-fastener....B. F. Hughes et al
Door-hanger....N. D. Wells
Door-hanger tracks, Means for supporting.... J. M. Hopkins
Doubling-machine....G. A. Wettengel
Draft-equalizer....J. O. Helgeson
Drafting instrument....V. Higgins et al
Drag and harrow, Road....H. D. Guffey
Drawing-board....W. F. Wagner
Drawing-press....L. C. Sharp
Drier....P. W. Holstein
Drum muffler, Snare-....G. A. Smith
Dye, Brown vat....K. Schirmacher et al
Dye, Direct cotton....J. Turner
Dye lakes, Making red azo....O. Ernst et al
Dye, Red azo....C. O. Müller et al
Dye, Red tetrazo....E. Meyer
Dye, Red tetrazo....K. Jedlicka et al
Electric furnace....L. Dion
Electric heater....E. F. Porter
Electric machine, Dynamo-....J. M. Barr
Electric machine, Dynamo-..E. M. Tingley et al
Electrical apparatus....R. P. Jackson
Electrical control system..H. L. Van Valkenburg
Electrical generators, Method of operating and system of control for....B. G. Lamme
Electrical separation of particles from a fluid stream, Apparatus for....L. N. Morscher
Electroplating holder....W. Y. Buck
Elevator stopping mechanism, Plunger-.... T. Larsson
Engine-starting means, Gas-....D. Fergusson
Engines, Apparatus for cooling cylinders of gas-....A. Knox
Engines, Igniter-rod for gasolene-.... R. J. Rennie
Engines, Sparking-circuit controller for explosion-....W. E. Dow
Envelop-opener....H. F. Hansen
Extracts containing tannin, Decolorization of.. A. J. Stiegelmann et al
Eye-shade....B. F. Wade et al
Eyeglass-cases, Machine for covering.... W. P. Devine
Fabrics, Producing impressions fast to water on textile....L. Lilienfeld
Fan or pump, Centrifugal, 3 pats (Reissue).... S. C. Davidson
Fan, Rotary....A. Barth et al
Fan-wheel and casing....W. W. Green
Feed and litter carrier....H. L. Ferris
Feeder....W. P. Jencks
Feeder, Variable-standard boiler-..E. P. Noyes
Felly....T. H. Walbridge
Fence....J. F. Johnson
Fence machine, Wire-....C. K. Chapin
Fence-post....C. A. Mendenhall
Fence stretcher, Wire-....E. E. Whitehead
File, Stick-....C. B. Cook
Filing device....N. H. Fulton
Filing-machine....C. J. Peterson
Filling-machine, Automatic....J. N. Humphreys
Filter....J. T. H. Paul
Filter and regulating tap, Combined water.... G. Kindermann
Filtering and decanting apparatus.... W. A. Hendryx
Finger-shield....H. H. Fulton
Fire-door, Vertical folding....R. W. Hare
Firearm....J. C. White
Fireproof door....P. J. Anquist
Flat-iron and conductor, Electric.... P. E. Oswald
Fluid or water jacket connection.... F. W. Schroeder
Fluid-pressure regulator....E. P. Noyes
Flying-machine....F. R. Sweeny
Folding chair....E. T. Morris
Footwear....A. W. Biddle
Form, Dress-....L. T. Furnas
Formic-aldehyde preparation and making same .... H. S. Blackmore
Fruit-picker....H. J. Bolinski
Furnace....J. J. Jones
Furnace-charging apparatus, Blast-.... D. I. Miller
Furnaces, boilers, ranges, &c., Portable fire-box partition for....M. D. Mason
Furnaces, Dog-house for open-hearth.... A. Cruickshank
Furnaces, Stoking....C. W. Crosby
Furniture....W. Person
Galley-lock....A. S. Orchard
Game....F. M. Greer
Game apparatus....C. W. Sears et al
Game apparatus....A. N. Thomas
Garment-fastener....J. Forman
Garment-supporter....J. M. Taylor
Garment-supporter....C. J. Daniel
Gas-burner cleaner, Acetylene-....D. Barnard
Gas heating apparatus....H. G. Steele et al
Gas-jet heater....J. W. Allen
Gas-producer....J. Bowey, Jr.
Gas-producers, Operating....E. P. Coleman
Gas-producing apparatus, Suction..H. H. Ralph
Gas-retort collar....W. G. Laird
Gases, Manufacturing combustible.... E. N. Dickerson
Gases, Preparing solutions of....H. Howard
Gasolene-tank....J. C. Gurley
Gate....G. F. Seiser
Gear connection....R. Braun
Gear-truing machines, Grinding-wheel-trimming mechanism for....F. A. Ward et al
Gearing....J. G. Kelly
Gearing....A. F. Rockwell
Gearing, Speed-changing and reversing.... W. A. Salter
Glove-protector....H. V. A. Hall et al
Goggles for horses....M. M. Boggs
Governor attachment....C. R. Welch
Governor for gas-engines, Electrical.... J. D. Anderson
Governor, Speed-....H. F. Snyder et al
Grading-machine....A. W. Snow
Grain-treating apparatus....W. F. Carlton
Graining material....A. Sutton
Grinding locomotive-frames, Machine for.... A. Forsyth
Grinding-machine feeding mechanism.... J. N. Heald
Grindstone attachment....J. M. Drake
Guano-distributer....G. H. Jernigan
Gun, Quick-firing....H. Otto
Gutter....G. W. Schodde
Harrow riding attachment....W. E. Johnson
Harrow truck, Disk-....F. N. Steele
Hat-holder, Lady's....H. M. Garratt
Hatband, Ventilating-....J. Jaillet et al
Hay-loader....A. Otto, Jr.
Hay-rake, Side-delivery....H. B. Sperry
Headlight, Adjustable....I. D. McMannamy
Heating apparatus, Electrical..R. G. Pheysey
Heating system....H. L. Winslow
Hides, skins, &c., Machine for dressing.... J. W. O'Donnell
Hinge....J. A. Raith
Hinge, Window-blind....B. E. Byrd
Hoist....J. E. Hovendick
Hoisting apparatus....E. A. Collin
Hook and eye....J. Dugas
Horse-detacher....J. D. Lindsley
Hose....E. J. Coughlin
Hose-reel, Bracket....L. W. Parker
Hydrant....G. H. Traxel
Hydraulic motor....R. Davis
Ice from power-streams, Apparatus for deflecting frazil and anchor....F. C. Pierce
Illuminating device...A. W. Beuttell (Reissue)
Inhaler....F. I. Clark
Instep support or arch....J. Sandler
Insulator....C. C. Johnson
Internal-combustion and other fluid-pressure engines....D. Roberts et al
Iron, Manufacturing....H. L. Hartenstein
Ironing-gloss....G. Reichert
Jars, bottles and the like receptacles, Closure for....M. D. Converse
Jars, bottles, and the like, Closure for.... J. Karrmann
Jeweler's loop....M. R. Johnson
Kettle....F. N. Martindale
Kettle-protector....H. T. Kellogg
Kiln....M. H. Avram
Knitting-machine stop-motion..A. L. Brumbach
Labeling machine, Bottle-....G. A. Hoffman
Lace-retaining device....J. A. Elphinstone
Lacing-holder for wearing-apparel..F. B. Almy
Lamp....R. E. Bruckner
Lamp, Arc-....W. S. Weedon
Lamp, Electric-arc....W. S. Weedon
Lamp, Miner's....W. Tunnessen
Lamp shade attachment, Electric-incandescent-.... A. F. W. Meyer
Lamp, Vapor-....W. T. Wood
Lard-compounding machines, Cooling device for .... R. L. Wright
Last-manufacturing machine....W. E. Trufant
Lathing, Composite....F. Wolf
Legging....M. Rosenwasser
Linotype-machine, 2 pats....H. Petersen
Linotype-machine....F. B. Converse
Linotype-slug trimmer....G. E. Wallin
Liquid-drawing apparatus.... L. W. Harrington et al
Liquid-meter....R. Fritsch
Liquid-treating apparatus....W. A. Hendryx
Lixiviating apparatus....C. E. Arnold
Lixiviating apparatus....E. N. Trump
Loading-machine....P. S. Severin
Lock....S. Drew
Locomotive-crane, 2 pats.... V. R. and E. H. Browning

Locking device....J. A. Lamont
Log-clamp....W. Z. Wilkinson
Log-loading machine....J. R. Buckely et al
Loom stop-motion....B. Forster
Loom, Swivel-....A. Lang
Loose materials, Apparatus for handling....G. W. Jackson
Lubricator....W. W. McCarty
Mail-bag catcher and deliverer....H. E. Messersmith
Mail-bag deliverer....O. C. Brett
Mail-bag deliverer, Double....A. A., Jr., and D. F. Douglass
Mail-bag-delivery apparatus....A. F. Markwell
Mail catcher and deliverer....S. T. Long
Mail catching and delivering apparatus....O. C. Harden
Mail-crane....S. T. Long
Mail-marking machine....F. C. Ielfield
Mail-pouch receiver....H. Clay
Mail-pouches on railway mail-cars, Apparatus for catching and delivering....M. E. Allen
Manure-loader....C. O. Linn
Manure-spreader....J. F. Rude et al
Marble slabs or the like, Cut-off machine for....J. R. Peirce
Match-receptacle....N. O. Bull et al
Measuring light....W. J. Hammer
Measuring light, Apparatus for....W. J. Hammer
Measuring-machine....W. T. Hollis
Mechanical drier, 2 pats....W. M. Cummer
Medical appliance....S. Rolfson-Schmidt
Medicinal composition, Making a..J. C. Slack
Mercury-vapor apparatus....P. H. Thomas
Metal-bound box....E. E. Flora. (Reissue.)
Metallic hoop....J. W. Brainard
Meter....E. Ek
Meter-regulator....T. B. Wylie
Mill....G. A. Browne
Mining-machine....A. Palmros et al
Mining-machine....D. N. Osyor
Miter-box....G. Magrath
Mixing machinery....H. Skinner
Molding-machine, 2 pats....W. W. Doolittle
Motor control system, Electric-, 2 pats....H. D. James
Motor-starter, Automatic....E. H. Smythe
Mouth-prop....J. L. Gehorsam
Muffler....C. J. Gustafson
Music-holder and leaf-turner....A. E. Kerfoot
Music-leaf turner....C. Hughes
Music-playing instrument, Autopneumatic....F. C. White
Musical instrument, Mechanical....C. Maerten, Jr.
Musical instrument, Mechanical...P. J. Meahl
Musical instrument, Stringed....H. L. Suter
Musical instruments, Differential valve for pneumatically-controlled....P. Welin
Musical instruments, Note-sheet-feed mechanism for....W. E. Cleveland
Necktie-knot....A. Swanson
Needle-threader....S. C. Early
Nut, Check-....C. H. Chapman
Nut-lock....R. K. Gregory
Nut-lock....H. G. Frew
Nutcracker....F. E. Proctor
Oar, Pivoted....D. F. Merriman et al
Oil-burner....R. C. Nelson
Oil-tank, Non-explosive....F. W. Reiber
Ore, Jigging machinery for dressing....G. J. Dawbarn
Ore-sampler....C. L. Constant
Ore-treating apparatus....W. A. Hendryx
Ores, Treating....W. A. Hendryx
Packing-box, Safety....P. J. Sisco
Packing, Journal-bearing....A. R. Scott
Packing-table....L. Abraham
Padlock, Combination-....E. E. Sutton
Padlock, Keyless combination-....B. Kreuzberger
Paint-machine....V. Aranguren y Bustinza
Paper, Manufacture of....H. Gaara
Paper pail....B. I. Rike
Paper-treating tank....A. C. Rice
Parachute-arrow....C. R. Stewart
Paste-box and dauber....E. M. Scranton
Pavement and making the same....W. S. Houghton
Pavement or roadway and making same....W. S. Houghton
Paving blocks or bricks, Means for handling....J. Sheridan
Pen, Fountain-....W. F. Barrett
Pencil-carrier....G. A. Oberg
Pencil-sharpener....C. C. Spengler
Pencil-sharpener....S. B. Jones
Pencil-sharpener....R. V. Collins
Pencil-sharpener attachment....J. C. St. John
Perch, Fowl-....A. Peris
Phonographs, graphophones, and the like, Apparatus for manufacturing cylindrical records and blanks for....J. Ames et al
Photograph-cabinet....F. J. Busald
Photographic print apparatus...W. E. Sinclair
Photographic-printing-machine pad....J. C. Calhoun
Physician's case....P. Ruehlmann
Piano-bench....H. L. Schuff
Picture-hook....A. H. Kemper
Picture-moldings, Auxiliary holding-strip of metal for....G. F. Drew
Piling, Metal sheet-....G. W. Jackson
Pipe-bending machine....C. B. Morton
Pipe cleaner, Smoking-....W. H. Boughton
Pipe-closure....A. Andrews
Pipe-coupling....C. F. Dotts et al
Pipe cutter, Trench-....J. E. Moore
Pipe-elbows, Making corrugated sheet-metal...F. Brune
Pipe hanger, Train-....J. F. Drake
Pipe-lifter....M. E. Layne
Pipe-molding machine....W. A. Murray et al
Pipe or hose coupling....J. H. Phillips, Jr.
Pipes or tubes, Apparatus for rifling...C. Fell
Planer driving mechanism....B. D. Stevens
Planter attachment....G. Weidinger
Planter attachment, Seed-....G. W. and H. Sterken
Pliers....E. A. Gemeny
Plow, Motor-....P. H. Munroe
Plow-point....C. G. Gertz
Polishing, Process of....A. Giese
Post-mold....H. Ballinger
Power-transmitting means....R. S. Prindle
Press for the manufacture of articles from granular or fibrous material..E. Würl et al
Printing for embossing, scoring, and die-cutting, Securing absolute registration in....F. J. Holmes
Printing machine, Bag-....C. E. Dulin
Propeling apparatus, Boat-....J. E. Carroll
Pruning instrument....S. P. Hayward
Pulley construction, Sheet-metal....F. Philips
Pulley, Gripping-....F. H. Frost et al
Pulley, Sling-....J. M. Boyd
Pump....J. W. Bagby
Pump, Air-....S. E. Spencer
Pump, Centrifugal....E. F. Welch
Pump, Rotary....R. Berrenberg
Pump, Rotary....J. Müller
Pumps, Lining for casings of rotary....A. W. Jones
Pumps, Spring-pressure regulator for....L. W. Haskell et al
Punch, Hand-....H. E. Walter
Putty-applying tool....T. J. MacLaughlin
Pyrographic or cautery device....T. W. Miller
Rail-bending device....V. Pilia
Rail-bond....A. H. Englund
Rail-joint....F. Neralic
Railway cross-tie....G. R. Mavis
Railway-gate....A. Wyper
Railway, Pleasure-....E. G. Geores
Railway-rail....J. Francis
Railway-rail tie, Concrete....C. L. Ruse
Railway-signal....E. M. Cain
Railway-signal....A. W. Harvey
Railway-signal....S. M. Ward, Jr.
Railway signal system....E. E. Gabbart
Railway signaling system, Electric....E. B. Howell
Railway switching device, Automatic electric..F. M. Rice et al
Railway-tie....J. H. Norton
Railway-tie....P. K. Ream et al
Railway-tie and fastener for securing the rails thereto, Metallic....C. E. Powell
Railway-tie and rail-fastener, Combined....J. F. Stoner
Razor-guard....E. B. Gibford
Receptacle, Collapsible....H. J. Potter
Register....H. W. Sayles
Registering apparatus....P. Winsor
Registering mechanism....F. P. Stevens
Rein-support....T. C. Thompson
Renovator....J. H. Green
Rheostat....S. A. Leonard
Rifle-sight....M. E. Sutherland
Road and making same....B. N. Beard
Roasting and smelting furnace....J. J. Brown, Jr.
Rock-drill....J. S. Harlow
Rock-drill, Turbine-driven....M. Kellow
Rock-driling machine or engine....H. Hellman et al
Roller-mill....E. Brown
Rotary engine....A. Hopkins
Rotary engine....J. C. Barnes
Rotary furnace applicable for use in roasting ores or the like....W. Hommel
Rubber-extracting machine....S. Kirk
Salt-cellar....P. A. Peterson
Sash-lock....O. E. Lamberson
Sashes, Machine for making and driving tacks in window-....C. E. Johnson
Sashes, window-screens, &c., Fastener for storm-....M. Hauser
Sausage-stuffing machine....E. J. Hallahan
Saw guard, Circular-....R. W. Hood
Saw jointer, set, swage, and gage, Combined....H. L. Trueblood
Saw-recutting mechanism....J. C. Gebhart
Saw-set....W. J. Boynton
Saw-swaging machine....J. C. Fox
Scale, Automatic weighing-....F. C. Osborn
Scaling-machine....A. L. Burri et al
Scourer, Shaking-....S. T. Wilson
Scraper....J. B. Ackermann
Scraper for grain-drills or other vehicles, Wheel-....J. Murr
Seal impressing or printing machine....F. Gottschalk
Seals on papers, Device for impressing, 2 pats....F. Gottschalk
Sealing cap, Bottle-....E. J. Godman
Sealing machine, Envelop-....T. F. Bowes
Seat-supporting device....W. S. Grey
Secondary battery....R. J. Fleischer
Seed-drill feed-cup....F. Dahlund
Self-setting trap....I. L. Kindig
Sewing-machine bobbin-carrier....P. Anschütz
Sewing-machine feed mechanism....C. F. and M. T. Goforth
Sewing-machine folding and taping guide....W. L. Swift
Sewing-machine stopping-gear....J. Beattie
Sewing-machine table....E. C. Saettler
Sewing-machine tension....C. F. and M. T. Goforth
Shafts, Means for lubricating rapidly-revolving vertical....I. P. B. Knudsen
Shafts, Rotating means for reciprocating....J. P. Karns
Sharpening machine, Saw-....R. F. Daniels
Shearing, Cutter for sheep-....S. L. Johnson
Shipping-case, Knockdown...L. S. Stiles et al
Shock-loading machine....E. N. Smith et al
Shoe....J. F. Davis
Shoe....E. Kelly
Shoe....W. E. Gilman
Shoe, Sporting-....T. Corcoran
Shovel, &c., handle....F. Skelton
Shutter-fasteners, Sill-plate for....H. Zimmerman
Shutter or blind operating device....D. Drawbaugh
Shutter, Rolling....J. G. Wilson
Sifting apparatus, Ash-....J. L. Laverty
Sign apparatus, Barber's....P. Zarella
Sign, Electric....G. C. Nientimp
Signaling apparatus, Selecting device for electrical....J. Burry
Signaling, Electric....W. E. Hallett et al
Sled, Bob-....L. D. Iannell
Smelting-furnace, Reverberatory....A. D. Lee
Snap-hook and buckle, Combined....J. W. Hutchison
Snow-melting machine....A. S. Emerson
Snow-plow coupling device....J. W. Russell
Solid material, Apparatus for treating....J. Gormly
Solid material, Treating....J. Gormly
Solid materials, Apparatus for classifying....R. E. Trottier
Sound, Device for regulating and justifying reproduced....A. Ford
Spark-coil....J. O. Heinze, Jr.
Spark-plug....E. Bruden
Sparking-plug....L. Kantrowitz
Speed-indicator, 2 pats....E. T. Greenfield
Spherical structures, Jacket for..F. L. Sheldon
Spinning-machine attachment....P. D. Gould
Spoon....W. P. Herbst
Sprinkling machine, Sand or other....N. St. Peter
Square and siding-gage, Combined try-....W. J. Finn
Stacker, Pneumatic....L. M. Anderson
Stair, 2 pats....S. Grossman
Stair....J. V. Matteson
Stairway, Moving, 2 pats....G. A. Wheeler
Stairway, Moving spiral....G. A. Wheeler
Stamp, Hand-....J. W. Crouse et al
Stanchion, Cattle-....W. H. Rodden et al
Steam-boiler, Sectional water-tube..H. Del Mar
Steam superheating apparatus...E. F. Osborne
Steamship....A. M. Hurel
Stirrup....K. F. Ebel
Stirrup, Safety-....W. Jones
Stoking apparatus....C. W. Crosby
Stop-motion, Twister....A. E. Rhoades
Stove, Alcohol-....A. Richter
Sweep-holder....W. W. Reid
Switch-controlling mechanism....J. M. Lieb
Switch-operating mechanism....F. A. Fricker
Syringe....J. Kinsel
Tack or nail driving device....P. R. Glass
Tack-puller....J. E. Naudain
Tank-heater....M. A. Thorpe
Telegraph-lines, Duplexing....I. Kitsee
Telegraphic system, Cable....I. Kitsee
Telegraphy....I. Kitsee
Telephone cut-off or muffler....G. S. Knowles
Telephone-exchange system, 3 pats....E. R. Corwin
Telephone-switchboard signal apparatus....G. H. Ryder
Telephone system, 2 pats....E. R. Corwin
Telephone, Wireless....F. J. McCarty
Telephony....I. Kitsee
Temperature-regulator....V. F. Davis
Thread-cutter....J. F. Wilkins
Thumb or finger attachment....N. Duperrault
Tile....J. H. Pugh
Tire, Cushion-....J. B. Jordan
Tire, Pneumatic....C. E. Titus
Tire-tightening apparatus....G. R. Macomber
Tire, Vehicle-....H. A. Knox
Toaster....N. S. Clark
Tobacco cutter and box....J. H. A. McPhee
Tobacco product and manufacturing the same....K. E. Rogers
Tobacco-stemming machine....J. O. Morris
Toilet-seat, Sanitary....J. A. Kleine
Token-holder....R. N. Simpson
Tongs, Pipe and rod lifting....O. Wilson
Tool....J. L. Janeway
Tool, Combination-....C. C. Fields
Torpedo-expulsion tube....L. Y. Spear
Torpedoes on railways from platforms, Machine for distributing....J. A. Hall
Toy, Pyrotechnical....A. Jedel
Trace-splice....J. Fisher et al
Track-clearer....G. A. Parmenter
Traction-wheel....H. H. Rohlf
Transmission mechanism, 2 pats..O. W. Davis
Transmission mechanism, Variable....O. W. Davis
Trimmer....J. E. O'Hearne
Trolley....C. M. Whitcomb
Trolley....A. S. Janin
Trolley-wheel....F. M. Gass
Trolling-spoon....F. S. Sams
Trousers-stretcher....M. B. Jackson
Truck, Car-....J. Murphy
Trucks, Conveyer for hand-...H. C. Coward
Trunk-harness tightener....G. M. Powers
Tube-cleaner....T. Andrews. (Reissue.)
Tunnels, Method and apparatus for constructing subaqueous....B. Douglas
Turbine....J. Hissink
Turbine, Multiple-stage....J. Karrer
Type-writer....C. M. Sorensen
Type-writer operator, 2 pats..B. F. Hutches, Jr.
Type-writer platen....W. R. Van Slyke
Type-writers, Keyboard-cover for....A. L. Gilbert
Type-writing machine....C. A. Bennett
Type-writing machine....H. W. Merritt
Type-writing machine....M. W. Pool
Type-writing machine....J. A. Ronchetti
Type-writing machine....A. T. Brown and A. J. Briggs
Type-writing machine....J. C. McLaughlin
Umbrella, Folding....J. Casale
Upholstery....B. H. Messersmith and W. Healy
Urinary apparatus....V. D'Incognito
Valve....C. Kapenos
Valve, Engine-....J. W. Chenoweth
Valve for radiators....F. W. Leuthesser
Valve for radiators, Air-, 2 pats....F. W. Leuthesser
Valve-gage....A. O. Kooken
Valve, Radiator-....F. W. Leuthesser
Valve, Receptacle-filling....W. J. Cunningham
Valve, Reversing-....U. A. Peters
Vapor-burner, Incandescent....J. C. Heinritz and J. W. McCuen
Vehicle dumping bed or body....T. A. and E. L. Faughnan
Vehicle, Motor road-....F. H. Royce
Vehicle-reach....J. M. Bryant
Vehicle-seat....C. F. Barndt et al
Vehicle storm-top....T. A. Welshans
Vehicles, Spring-wheel for road-....F. Wicks
Velocipede....C. F. Speice
Vending machine, Stamp-....E. E. Wigzell
Vessel or the like, Double-walled...R. Burger
Vessels, Indicator for locating sunken....J. Long et al
Vibrator....M. K. Golden
Wagon....E. C. Litchfield et al
Wagon attachment....L. S. Hyde
Wagon, Dumping-....J. J. Enly
Wardrobe-bureau....J. Bryant
Washer....C. G. Ette
Washing apparatus....F. Stocker
Washing-machine....W. D. Whitney
Washing-machine, Circulating....W. Bartholomew
Water-closet....A. M. Morrison
Water-closet, Outdoor....A. G. Naviokus
Water-gage....P. I. Scott et al
Wave and current motor....C. G. Roehr
Wave-motor....S. R. Milbury
Weighing apparatus....M. H. Avram
Well-drilling machinery....H. R. Decker
Wheel....A. L. Jiménez
Wheel....C. B. Van Horn
Whiffletree-clip....A. Miller
Window, Casement-....E. P. Sperr
Window construction, Sheet-metal....E. A. Sanders
Window fastener, Show-....G. C. Marr
Window-screen....F. E. Taylor
Wire-cutting device....C. Burdick
Wire fastener, Line-....L. Stanton
Woodworking-machine feeder....J. C. Ludwig, Jr.
Wool-washing machine....F. G. Sargent
Wrapper for braid and similar articles....J. Baer
Yeast compound....J. E. Yost
Yeast from fermenting whisky-mash, Means for removing....O. G. Luyties

DESIGNS.

Automobile-horn....H. W. Lester
Badge....W. Brooks
Badge....J. W. Cherry
Easel....J. B. Timberlake
Lamp globe, Electric-....J. W. Phelps
Radiator....J. A. Field
Speedometer-casing....J. W. Jones
Type, Font of printing-....M. F. Benton
Ventilator-cap....J. B. Martz
Watch-charm....J. W. Cherry
Water-closet-cistern casing....R. E. Crane

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MECHANICAL PATENTS.

Abdominal supporter....K. Koerner
Abrading and polishing material, Tool for holding sheets of....M. O. Randall et al
Addressing-machine....C. Owens et al
Advertising apparatus....W. P. Dun Lany
Advertising apparatus....W. J. Sawyer
Advertising apparatus, Traveling....D. J. McOsker
Advertising device....A. J. De Barry
Advertising device....T. Kharas
Advertising device....W. Fraser
Air-ship....S. Lake
Amusement apparatus....A. Malsin
Animal-carrier....S. L. Cook
Animal-releasing device....H. J. Hanson
Annealing-box....L. J. Campbell et al
Anvil, Plow-....A. L. Cox et al
Apricot-cutter....R. Good
Apron....J. G. Lyons
Asbestos sheathing to structural framework, Means for attaching....C. E. Wade
Assembly-chair....J. C. Brooke
Automatic gate....F. T. Fay
Automobile speed-controlling mechanism....T. B. Jeffery
Axle-box....E. J. Wood et al
Bag-holder....E. M. Sutton
Bag-holder....C. L. Bond
Bait, Artificial....E. A. Pflueger
Bales with wire, Apparatus for securing compressed....F. M. Giddings
Bandage, Elastic woven....W. J. Teufel
Bark-removing machine....C. Bache-Wüg
Bearing for shafting, Self-alining....W. B. Mair
Bed and couch, Combined....J. L. Blake
Bed-bottom fabric....H. Richardson
Beer-cooler....E. B. Hogan
Bell, Door-....N. B. Le Fevre
Belt-guide, Automatic....H. F. Snyder
Belt-stretcher....W. Lozo
Berry-box....H. Alwes
Billiard and other game table..H. G. Barrett
Blending-machine....G. J. Hicks
Blower....W. McClave
Boiler-flue blower....A. S. Dillon
Boiler-flue cleaner....A. Grönvald
Boiler-flues, Apparatus or tool for reducing the ends of....W. A. Skinner
Boiler-tube-calking device....H. Kuntze
Bolt-operating and automatic locking mechanism....J. Meikle
Book and copy-holder, Note-....H. W. Avis
Book, Check-....F. C. Rhodes
Boring-jig....A. W. Thomas
Bottle, 3 pats....J. C. Anderson
Bottle-closure....H. P. Roberts
Bottle-neck and attachment therefor....D. S. Haynes
Bottle, Poison-warning....T. Newman
Bottles and the like, Stopper or closure for....P. Conrad
Brake-shoe, Railway-car, 2 pats..S. A. Crone
Bread-baking machine Altar-....M. A. Horan
Brick-cutting machine....H. Heuss
Bridle-bit....P. S. O'Neil
Brooder-house....G. H. Lee
Buckle for webbing, One-piece....F. A. and J. B. Russ
Buckle, Suspender-....G. A. Weld
Building-blocks, Apparatus for forming artificial....A. A. Pauly
Building-light....P. Schwickart
Button, Display or campaign....E. H. Roy
Button or badge....J. B. McDonald
Buttonhole-protector....L. Schiff
Cabinet, Kitchen-....W. H. Curtice et al
Cable-terminal....F. B. Cook
Cableway, Marine....T. S. Miller
Cager and automatic sump-guard..G. Holmes
Calculating-machine....E. J. Brandt
Calculating-machine....S. S. Ensign
Cames, Machine for producing..T. W. Morrell
Can for receptacles and making the same, Metallic....W. H. Dodge
Capstan, Horse-power....J. S. Swenson
Car....E. I. Dodds
Car, Automatic dumping-....J. W. Reed
Car-bolster....J. Allison
Car chock-brake, Railway-....J. E. Gabriel
Car-coupling....P. Schmidt
Car-coupling draw-bar....L. Boirault
Car-door fastener....C. G. Harrington
Car draft-gear, Railway...C. H. Howard et al
Car, Dumping-....W. W. Wallace
Car, Dumping-....C. P. Astrom
Car-ender....A. J. Berg
Car-fender....J. M. Smith
Car, Railway-....C. H. Jaeger
Cars, Emergency-bolt for draft-timbers of railway freight-....T. J. Gannon
Cars, Switch-throwing device for street-railway....W. A. Jones

Cars, Third-rail attachment for electric.....G. H. Sohn
Carbon chlorids, &c., Making.....H. S. Blackmore
Carbonator, Injector.....J. H. Fox
Carbureter.....H. T. Thomas
Carbureter for internal-combustion engines.....J. C. Schneble
Car-supporting device.....E. L. Sherwood
Carpet sweeper and cleaner....J. M. Spanlger
Carriage and automobile body.....M. J. Rothschild
Cartridge, Blasting-.....P. Selbaeh
Casting apparatus, Die-.....A. G. Rauth et al
Casting device.....P. Schiwickart
Cattle-guard.....M. R. Wilhite
Cell-case machine.....G. W. Swift, Jr.
Cement from blast-furnace slag, Manufacturing.....H. Colloseus. (Reissue.)
Cesspool, drain, and distributer.....S. B. Goff
Chain-machine.....F. E. Vandereook
Chair desk attachment.....F. James
Cheese-cutter.....R. Flemming, Jr.
Cheese-mashing machine.....E. Biggs
Churn-motor.....A. E. Linton
Churn-operating mechanism.....E. Riley
Chute.....E. W. Ritter
Cigar-mold, 2 pats.....N. Du Brul
Cigar-tip perforator.....A. W. Stephens
Cigar-wrapper-cutting machine....A. Du Brul
Cigarette box and case.....G. Albrecht
Cigarette-holder.....E. T. Crane
Cigarette-pipe.....A. Weisz
Clamp.....H. J. Arnold
Clasp.....P. W. Hoffman
Cleaning-machine.....D. E. Preston
Clock and call system, Illuminating electric.....G. B. Maas
Clocks, Marking device for watchmen's.....A. A. Newman
Cloth-finishing machine.....T. B. Kazanjian
Clothes-fastener.....L. Risley
Clutch driving device.....J. M. Daly
Coat.....W. T. Connor et al
Coat, hat, and umbrella-hanger, Combined.....J. S. Robinson
Cock, Adjustable stop-.....F. M. Holliday
Coil, Ruhmkorff.....J. McIntyre. (Reissue.)
Coin-card.....J. H. Knight
Collars, &c., Folding-machine for....G. Reece
Colter.....B. Ross
Compass-point, Interchangeable..J. Eichmüller
Compressor, Rotary.....C. C. Palmer
Concrete composition for building material.....H. S. Albreeht
Concrete pipe, Reinforced....C. H. Cartlidge
Concrete, Protective setting for metallic bodies in.....R. T. Kanski
Concrete sewer construction.....B. Lowther
Concrete structures, Reinforcing-frame for.....G. M. Graham
Condenser, Vapor-.....J. C. Clark
Cooking vessel, Domestic.....A. W. Cram
Coop.....J. J. Noser
Coop.....M. C. Frits
Cork-extractor.....H. L. Medley
Corn-holder.....J. Bustanoby
Cot and bath-tub, Combincd.....R. L. and J. B. McCord
Cotton-squares, Machine for gathering.....K. S. Bunting
Course-marker.....E. H. Barney
Cow-tail holder.....L. G. Webb
Crate.....J. Hettrich
Crate, Self-cleaning knockdown poultry and merchandise shipping.....S. W. Bell
Cream-separator.....O. Anderson
Crutch.....C. B. McConnell
Culvert, Knockdown...F. S. and F. H. Beach
Curb, drain, and conduit.....R. T. Hooper
Curtain-fixture.....C. L. Hopkins
Curtain-pole.....A. Marr
Curvature-gage.....G. W. Haas
Cushion.....J. S. Bukacek
Cushioning device.....F. O. Kilgore
Cut-out mechanism for electrically-operated machines.....C. S. Conger et al
Cycle motor, Four-.....A. G. Spencer
Dead-centers, Device for overcoming.....J. B. Hamric et al
Derrick.....A. Taylor, Jr.
Desk and seat, Combined school..J. C. Brooke
Desk and seat, School.....J. C. Brooke
Disintegrator, Digesting-.....M. R. Kennedy
Display-cabinet.....D. F. Grecnawalt
Display-stand, Rotary.....C. L. Gerken
Dividers and calipers, Spring.....A. F. Voss
Door-catch, Engine-house.....D. E. Dampman
Door or gate support and closer....A. J. Gray
Door-securer.....H. A. Johnson
Door-stop.....J. Gerson
Draping-machine.....S. S. Sencenbaugh
Dredges, Dumping mechanism for dipper-.....W. Clifford et al
Drum.....A. D. Converse
Drum attachment.....A. C. Ludington
Drum, Snare-.....V. Platz, Jr.
Drying apparatus.....G. A. Cutter
Dynamo, Wind-operated.....E. J. Johnson
Earth-handling machine.....O. L. Neisler
Edible matter, Device for curing.C. B. Trescott
Educational device.....J. A. Foley
Electric alarm, Thermal.....L. Currier
Electric furnace.....A. J. Petersson
Electric induction-furnace....K. A. F. Hiorth
Electric machine, Dynamo-.....V. G. Apple
Electric switch.....A. A. Wohlauer
Electric transmission of intelligence.....I. Kitsee
Electric-wire connector.....C. J. G. Keiner
Electrical-conductor support....F. B. H. Paine
Electrical-distribution system.J. L. Woodbridge
Electromedical battery.....E. T. Otto
Elevator safety attachment..D. K. Wallingford
Elevator safety device.....A. Hodson
Ellipsograph.....J. T. Kelley
Embroidery-frame, Shuttle-machine.....H. Hochreutener
End-gate fastener.....L. and J. A. Carter
End-gate. Wagon.....C. E. Carroll
End-gates and the like, Fastening device for wagon.....J. Huffman
Engine.....M. L. Harris
Engine.....C. O. Robertson
Engine-stop.....T. Grieve et al
Envelop-fastener.....E. B. Stimpson
Envelop-fastener.....E. E. Runyon
Excavating machine, Tunnel-...G. W. Jackson
Excavating-tool.....R. A. Bonnell
Eyelet.....P. R. Glass
Fabric, Machine for braiding tubular.....L. A. Jones
Fan, Power-.....G. W. Weiss
Fastener.....J. Bustanoby
Fastenings, Machine for inserting...T. Briggs
Fence-clamp.....W. B. Shotwell
Fence clamp, Wire-....H. H. and H. C. Harris
Fence-post.....G. H. Ward
Fertilizer-distributer.....H. A. Murry et al
Fire-engine heater.....W. F. Messiter
Fire-shield.....D. S. Watson
Fire-truck signal.....J. Kenlon
Firearm.....B. F. Langdon
Firearm-sight.....F. A. Schanz
Fish-hook.....A. F. Bingenheimer
Fish-hook guard.....C. R. Carpenter
Flange.....P. Bynum
Floating-structure, Steady-.....W. E. Murray
Floor-scrapers, Sweeping attachment for.....J. B. Ackermann
Fly-trap.....R. L. Ramsey
Flying-machine.....D. D. Beatty
Fuel, Artificial.....J. W. Ivery et al
Fuel, Binder for compressing.....W. F. Giles
Fuel, Waterproofing material for artificial.....J. W. Ivery et al
Furnace.....J. Greis
Furnace-charging mechanism.....D. Baker
Furnace for metallurgical and smelting purposes.....K. Birkeland et al
Furnaces, Preparing fine particles of iron oxid for use in blast-.....U. Wedge
Fuse, Electrical.....A. G. Charters et al
Game-choker.....C. H. Kessler
Garment.....S. Greenes
Garment pressing and forming apparatus.....J. M. Stein
Garment-support.....R. Klein
Garment-supporter.....M. Waterstraut
Garnet-machine.....J. K. Proctor
Gas-explosion engine.....G. C. Bourdereaux
Gas-furnace.....E. A. Newcomb
Gas-meter.....J. R. Armstrong
Gas-motor engine.....C. B. Wattles
Gas-pressure regulator.....V. E. Bean
Gas-purifying apparatus.....N. T. Harrington
Gas-purifying apparatus.....E. Higgins
Gas-service pipes, Antifluctuator for.....W. M. Wood
Gate-fastener.....T. J. Thompson
Gcar-calculator.....H. W. Fellows
Gearing.....J. Fair
Gearing.....J. S. Barnes
Gearing, Change-speed.....J. L. Didier
Gearing, Power-drum.....C. F. Callahan
Glass-drawing method and apparatus.....F. L. O. Wadsworth
Glass for making glass insulators or similar articles, Feeding molten....H. M. Brookfield
Glazing-strip.....W. F. Tenney
Gold-saving apparatus.....L. Sachse
Golf-ball.....F. H. Mingay
Golf or similar games, Device for use in playing.....N. O'Shaughnessy
Grader.....A. B. Grodaes
Grain-drier.....F. J. Thull
Grain-separator.....W. A. Brewster
Grate.....J. Lees
Grater, Nutmeg-.....W. H. Davidson
Greenhouse-bench.....J. Wilson
Grinding device for sharpening the rotary circular knives of meat-slicing machines, &e.....W. A. Van Berkel
Grinding-machine.....G. M. Stedman
Grindstone attachment.....T. J. Murphy
Gun attachment.....G. Szemerey
Gun-rest, Folding.....S. L. Burnaugh, Jr.
Guns, Chain rammer for.....J. F. Meigs et al
Guns or the like to each other, Means for automatically indicating certain relative positions of.....W. D. Kilroy
Guy, stretcher, and clamp....G. F. Swortfiger
Hair-crimper.....A. Wilcox
Hair-roll.....R. H. Damon
Halter-rope.....H. A. Mett
Harrow, Spring-tooth.....L. M. Piester
Harvester, Corn-.....W. Hall
Harvesting-machine cutter-bar....O. C. Turner
Harvesting-machines, Bundle carrier and dropper for.....H. Ferris et al
Hay-loader.....H. M. Neuhaus
Head-gate.....W. J. Swords
Heating system.....J. J. Lawler
Heddle-frame.....C. E. Briggs
Hemp-brake.....F. O'Neill, Jr.
Hinge.....R. J. Morg
Hinge.....J. Murray
Hinge.....W. A. Markey
Hinge, Lock-.....J. A. Waters
Hitching device, Rein-.....W. E. Colenso
Hod.....W. G. Avery
Hog-tank.....U. G. Mignerey
Hooks and eyes, Art of coating and apparatus therefor.....W. M. Corthell
Hopper mechanism.....J. C. Mertens
Horse-blanket.....F. L. Nagel
Hose-clamp.....H. B. Sherman
Hose support, Lawn-.....L. E. Whitney
Husking-mitten.....J. W. Covert
Hydrocarbon-burner.....H. H. Ashlock
Ice-plow attachment.....S. Knecht
Igniter.....G. J. Schultz
Ignition system, Timing device for jump-spark.....W. D. Foreman
Incubator.....G. H. Lee
Index-cutting machine.....F. P. Rosback
Index-guide.....J. H. Rand
Indicator.....D. Levy
Insulator.....M. H. Strong
Ironing-board.....T. A. Davis
Journal-box cover, Dust-proof self-locking.....J. W. Gibney
Knockdown table.....L. Graumiller et al
Label-affixing machine, 2 pats....J. M. Brown
Laces, Tension device for shoe-....R. Dorothy
Ladder and washbench with ironing-board attachment, Combination step-..W. H. Johnson
Lamp and burner.....C. F. Fellows
Lamp-hanger.....W. R. Holeombe
Lamp-receptacle.....A. A. Moffitt
Lamps, Multiple socket for electric.....F. J. Russell
Last or form Shoe.....A. W. Sutherland
Lathe-dog.....J. McCarthy
Lathe, Staff-.....W. B. Mehl
Lettering apparatus.....C. R. Krueger et al
Lever.....T. A. Burke
Linotype-machine.....J. G. Holbourns et al
Linotype-machine.....J. R. Rogers
Linotype-machine.....W. H. Scharf
Linotype-maehine.....D. S. Kennedy
Linter-bats, Machine for making.....L. W. Haskell et al
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Loading apparatus.....W. C. Lipscomb
Lobster-claws, Device for binding...T. Jensen
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Lock.....R. Johnson
Lock.....H. R. Towne
Lock for levers, &c.....W. Honscheid
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Log-carrier and stake therefor.....N. M. Jones et al
Loom-shuttle.....O. Landry
Loom-shuttle, Hand-threading.....D. L. Norris et al
Loom-shuttles, Apparatus for changing.....G. Geppert
Loom stop mechanism.....A. A. Wendt
Loom take-up mechanism..L. B. Jenckes et al
Loom take-up mechanism.....A. A. Wendt
Loom-temple.....J. B. Cunniff et al
Loom warp stop-motion.....A. E. Rhoades
Looms, Filing fork for.....E. S. Stimpson
Lubricating apparatus.....K. Shaffer
Lubricator.....G. W. Blank
Machine-frame.....E. F. Hedderich
Magnet, Eye-.....H. Thomassen
Magnet for telegraphones.....J. A. Lieb
Magnifying-glass.....F. Bold
Mail-bag ejector and receiver, Automatic.....G. W. Somerville
Mail-box.....J. A. Siegfried
Mail-crane.....I. H. Pringle
Mail-delivering device.....I. E. Payne
Mail-wrapper.....L. Vecchio
Mailable papers, Means for closing and sealing.....R. M. Kerr
Mantles, Process and compound for treating..M. H. Hulings
Manure-loader.....J. D. Rietveld et al
Match-box.....G. W. Morgan
Measure, Linear contour.....G. W. Haas
Medicating and massaging appliance.....H. Robinson
Medicine-dropper.....J. A. Clifton
Medicine-measure.....A. R. Weber
Mercerizing.....A. E. Smith et al
Metal, Expanded.....J. Kahn
Metal-plate catcher.....A. J. Maskrey
Metallic tie, 2 pats.....W. Goldie
Metallic tie and rail-fastener....F. Klousnitzer
Milk-cooler.....P. Hay
Milling-cutter.....A. L. Valentine et al
Mine-cage safety device.....C. Shewan
Mixing device.....W. S. Morgan
Molding-machine.....T. H. Keller et al
Motor mechanism.....A. E. Miller
Motors, Fuel-feeding device for internal-combustion hydrocarbon-.....T. E. and H. J. Podlesak
Mower.....F. W. Gaefcke
Mowers, &c., Cutter-bar for.....D. R. Glezen
Muffler, Ear-.....T. H. Sherman
Musical instruments, Expression device for pneumatic.....E. De Kleist
Musical instruments, Pneumatic action for....T. Danquard
Musical instruments, Speed-regulator for automatic.....E. De Kleist
Necktie-holder.....J. C. Ryan
Needlework, Art.....P. Johnsen
Nose-ring.....C. B. Wagner, Jr.
Nozzle, Spraying-.....S. H. Adams
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Nut, Lock-.....J. M. Mathis et al
Nut-machine.....F. Lackner
Oil-burner.....M. A. Fesler
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Oil feeder, Lubricating-.....S. A. Lehman
Ore-concentrators, Slime-saving device for....B. E. Duggan
Ore-screen.....F. Franz
Overshoe-fastener.....J. Hopson
Package-carrier.....C. J. Miller
Package-carrier.....C. J. Miller et al
Packing.....C. H. Reynolds
Packing, Piston-rod.....A. C. Schaefer
Paper-cutting machine.....T. C. Dexter
Paper milk-bottle.....J. J. Burke
Paving-block.....H. A. Kratzer
Pen, Fountain-.....J. Bustanoby
Photographer's appliance.....E. N. Smith
Photographic apparatus.....D. D. Routh
Photographic apparatus, Electrically-operated..W. A. Chamberlain
Photographic-printing apparatus...A. Cottillon
Photometer.....V. H. Slinack
Piano, Player-.....G. Hochman
Piano-players, Note-sheet for autopneumatic...J. W. Clouse
Pianos, Modulating attachment for automatic..T. Danquard
Picture-moldings, picture-frames, and the like, Mechanism for use in the preparation of....C. E. Seckford
Pictures, Device to hang and unhang.....E. J. Dupeire
Pipe-coupling apparatus.....D. M. Kenyon
Piston.....J. Warnant
Piston.....W. Snyder et al
Piston-rob swab.....J. W. Evens
Pitman.....G. A. Cram
Planter attachment, Seed-.....C. O. Pallas
Planter, Potato-.....R. Blair
Planter, Seed-.....P. E. Williams
Plating apparatus.....C. G. Backus
Plug-cutting machine.....E. E. Elder et al
Plug, Wall-.....C. Lovely
Pneumatic-transmission-tube cartridge.....F. H. Wolever
Pole-supporter.....R. Hickey
Polishing-machine.....C. L. Hawes
Postal folder.....W. F. Sanders
Pot-cover.....E. J. Hansen
Potato-digger.....R. Blair
Power-developing apparatus....A. C. Eastwood
Power mechanism.....C. E. Marshall
Power-transmission mechanism, Variable-speed.....G. L. Reenstierna
Precious metals, Concentrator or washer for..O. H. Wade
Pressure-governor.....W. McClave
Printing-chain-cleaning device..G. A. Chambers
Printing device, Stamp-.....F. C. Carroll
Printing mechanism for listing-machines, Total-.....D. E. Felt et al
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Pulp or jute boards and the product thereof, Making waterproof wood-....C. B. Jameson
Pump.....L. Benson and W. Abrams
Pump attachment.....T. McNally
Pump-piston.....T. Turner
Pump, Water-balanced.....H. M. Spinolla
Pumping-jack.....J. R. Ware
Punch, Automatic center-.....F. Spalding
Puzzle.....C. S. L. Kennedy
Quartz-mills, Battery screen-frame for.....R. E. L. Lampson
Radiators, Foot-warmer attaehment for.....J. E. Jones
Rail-joint.....H. G. Gilmor
Rail-joint.....W. Taylor
Rail-joint, Insulated.....B. Wolhaupter
Rail-joints, Combined single-bar nut-lock and base-plate for.....H. N. Northoff
Railway, Aerial.....S. Y. Sweeney
Railway cross-tie and conneetion for rails on ties, Metallic.....M. Shaner
Railway, Electric.....C. Von Gizinsky and W. McClure
Railway-frog.....S. Canty
Railway-frog.....G. L. Bell
Railway-rail-fastening device.....G. Mackay
Railway signal system.....E. P. Cook
Railway signal system.....L. H. Thullen
Railway signaling system.....C. H. Lay
Railway-spike.....J. N. Draemel
Railway-switch.....C. F. Christopher
Railway-switch.....J. I. Reynolds
Railway system, Third-rail electric.....J. F. Feeley
Railway systems, Protector for third rails of.....J. N. Tomlinson
Railway-tie.....J. H. Houck
Railway-tie.....J. Ebinger and B. A. Steinke
Rake.....A. S. Burckhalter
Range-oven.....H. E. Janes
Receptacle and stool, Combined ventilated....I. Compton
Receptacle-closure, Hermetic....W. A. Lorenz
Reel for ruching, veiling, and like fabrics....W. R. Delaney
Refrigerating apparatus.....L. Levy
Rein holder and tightener for vehicles.....J. Altmeyer
Reinforcing-bar.....J. N. Loveley
Return-flue boiler.....W. Moran
Reversing timer and distributor.....J. O. Heinze, Jr
Rifles, Magazine for.....J. Mues and J. H. Matthews
Roll and making same.....F. Shuman
Roll-changing device.....H. C. Sbaw
Roofing bracket.....J. Layfield
Rotary engine.....G. M. Bard
Rotary engine.....F. M. Lechner
Rotary engine.....G. H. Carter
Rotary engine.....F. A. Cleveland
Rotary engine.....J. K. Gerrich
Rotary motor.....A. E. Arons
Rubber article having seams, Hollow.....I. F. Kepler
Safe, Folding.....F. Additon
Safety appliances, Device operated by controller reverse-lever for automatically operating.....A. J. Gairing
Sanding-machine.....F. L. Lane
Sandpapering machine.....J. P. Simmons
Sash fastener, Window-.....C. W. Prouty
Sash-operating mechanism.....W. F. Plass
Sash, Window-.....O. E. and E. W. Knight
Sashes, Stop device for sliding..G. H. Parker
Saw-log nigger.....W. E. Downing
Saw-set.....C. G. Miller and L. D. Metcalf
Saw-swage.....A. Draws
Sawdust collector and conveyer.....J. A. Weimer
Sawmill set-works, Pawl-lift for....M. Harris
Scale or meter....L. D. Goff and H. O. Spade
Scales, Patform-supporting hanger for.....J. L. Good
Scales, Poise-lock for.....W. E. Finch
Scraper, Road-.....C. H. Snyder
Scrubbing-machine, Rotary..T. R. Jenkins, Jr
Seal, Car-door.....J. F. Wing
Sealing apparatus, Hermetic-.....J. Merritt
Sealing device, Bottle-.....F. Dingman
Seats and the like, Metallic foot for.....E. G. Budd
Seed huller, Cotton-.....H. L. Cathey
Seesaw.....J. H. Wagner
Separating system.....T. T. Crozier
Separation of reaction products resulting from the sulfonation of aromatic bodies, Approximate.....W. Miersch
Separator.....H. Ruddick
Sewing-machine for finishing buttonhole-pieces, &c.....H. E. Hill
Sewing-machine shuttles, Bobbin-holder for...H. A. Bates
Sewing or fastening machines, Channel-moistening device for sole.....W. H. Hooper
Shade fixture, Adjustable window-.....H. Brenizer
Shade holder, Window-.....I. S. Sherwin
Shade-support, Adjustable....C. D. Ridenour
Shaft, Flexible.....A. L. Hale
Sharpener, Band-saw.....C. Wright
Shelf, Sheet-metal.....H. L. Beach
Sbingle, Metallic.....G. C. Sherman
Shock-gatherer.....F. James
Shoe-fastener.....E. Ellis
Shoe-polishing kit.....L. R. Loughborough
Shutter-lock.....H. D. Black
Signaling system, Electric.....F. L. O'Bryan
Skate, Roller-.....H. Carlsson
Skates, Shoe-protector for.....A. Wenning
Skaters in rinks, Apparatus for supporting roller-.....C. A. Spooner
Sleeve-protector.....P. J. Dahlinger
Slug, Protective.....S. D. Leland
Smoke-consumer.....R. R. Shipley
Smoke-consuming apparatus.....F. M. Reed
Smoke-consuming furnace, Hot-air..F. Fisher
Smoke-purifier and fume-arrester.....T. E. Lambert
Smoking-pipe.....H. Maas
Snow-plow.....A. Darling
Soap-distributer for toilet use.....J. W. Hoffman et al
Soil, &c., Apparatus for treating night-.....E. T. Welcome
Sole-leveling machine.....E. E. Winkley
Sounding device.....J. V. Martin

Spark-plug....G. J. Blum
Speed-changing mechanism....W. O. Foss
Spinning and twisting apparatus, Ring-....E. Hayden
Splice-bar....D. Ambrose
Spool attachment....L. J. Bonar
Spraying attachment for percusive tools....D. S. Waugh
Sprocket chain and wheel, Ball.R. H. Bowman
Stacker....J. L. Brim
Stall, Animal-....W. M. Underhill
Stand for holding manuscripts or writing or drawing patterns....O. Tzchachmann
Steam-engine....E. H. Knapp
Steam-engine....H. E. Lundgren
Steam-trap....R. Warg
Stenciling-machine....C. Gibbs
Stirrup-leather....W. M. Henley
Stirrup, Safety-....W. B. Goodwin
Stock and sales register....E. R. Tyler
Stones, Simulating rare, precious, and other....W. D. and R. W. Denton
Stool....W. F. Rowell
Store-service apparatus....C. J. Miller
Stove, Camp-....G. W. Ball, Jr.
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Stove-leg....C. G. Davis
Street-sweeper....R. I. Madden
Stuffing-box....J. C. Young
Stump and tree puller....S. M. Smith
Surgical instrument....C. N. Coulter
Surveying instrument....A. A. Brothen
Suture and ligature container..H. A. Flanders
Swing....A. P. Boyer
Switch-button, 2 pats....C. A. Clark
Tables, Metal extension-slide for....G. H. Welterlin
Tack-driving machine....W. E. Trufant
Tag-holder....L. Fournie
Talking-machine horn....S. Moss
Tank....A. A. Kramer
Tanks, Flow-controlling device for flushing-....F. Allen
Tape-line....E. D. Ayers
Telegraph system....S. D. Field
Telegraph system....C. K. Jones
Telegraphic transmitting-tapes, Means for producing....I. Kitsee
Telegraphy, 3 pats....I. Kitsee
Telegraphy, Wireless....I. Kitsee
Telemeter....A. König et al
Telephone system....H. P. Clausen
Thermostat....P. A. Brown
Thill-coupling....N. M. Bell
Thill-coupling....D. W. Copeland
Thread-cutting clip....H. R. Benda
Tightening device....P. Schwickart
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Time-indicator, Culinary....S. S. Wolfe
Tin-scrap, Detinning....M. Leitch
Tin-transferring machine....A. C. Donell
Tire-case....L. G. Cook
Tire for vehicle-wheels, Pneumatic.R. P. Scott
Tires, Armor for....F. E. Remark
Tool-locking mechanism, Machine-....A. L. De Leeuw
Tower....L. W. Noyes
Toy, Revolving....T. F. Slater
Transfer-table, Normal-surface, 2 pats....C. G. Hawley
Transom and shutter operating device....E. P. Webster
Trestle, Collapsible....P. F. Van Halder
Trolley....E. D. Peerstone
Trolley catcher and retriever....R. Shields
Trolley-pole....J. C. Gay
Trolley-wheel....R. F. Henne
Trolley-wire splicer....H. G. Dyer
Trousers-creaser....C. D. Fahl
Trousers-stretcher....G. R. Smith
Truck, Car-....E. H. Haver
Trunk....T. J. McKay
Trunk-strap fastener....O. A. Stoneman
Turn-table, Normal-surface, 3 pats....C. G. Hawley
Type-casting machine....O. V. Sigurdsson
Type-writer....J. W. Paul
Type-writers, Variable-spacing mechanism for....J. B. Hammond
Type-writing machine....B. C. Stickney
Type-writing machine....A. W. Hewitt
Type-writing machine....J. C. McLaughlin
Valve....L. S. Nash
Valve, Automatic cylinder-....J. Manton
Valve guide Flushing-....C. L. Holden
Valve mechanism for water-elevators....J. L. Latta
Vegetable-cutting machine....G. Vahle
Vehicle-brake....T. Robino
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Vehicle, Self-propelled....C. B. Hatfield
Vehicle, Self-propelled....J. Wilkinson
Vehicle shock-absorber, Self-propelled....C. B. Hatfied
Vending-machine....J. W. Murray
Vending machine, Newspaper-....C. H. Marr
Vending-machines and the like, Check-operated feeder for....H. Margolis
Ventilator....A. Baggaley
Vessels, Apparatus for raising sunken....S. J. Urbanski
Veterinary parturition instrument....R. Fairchild
Veterinary tooth-file....L. P. Helm
Wagon-box fastener....C. E. Meglemer et al
Wagon-brake, Automatic....C. Garver
Wagon-dump....S. Guth
Wagon, Dump-....J. W. Haywood
Wagons, Water-tank attachment for....E. Stone
Wall-decorating machine....F. J. Gutheil
Wall, Reinforced....A. Z. Chiodo
Washing-machine....M. M. Horne
Washing-machine....J. T. Burkhard
Watchcase....W. J. Gardiner
Water-closet seat....T. J. Florey
Water-heating apparatus....F. Dupuis et al
Web-feeding rolls....H. F. Bechman
Weighing and dumping machine, Automatic....R. D. Webb
Wheel attachment, Vehicle-....C. C. Phelps
Wheel-retainer and attachment-support....F. W. Lechner
Wheel shock-absorber, Vehicle-.W. E. Snediker
Wheels, Drive attachment for vehicle-....J. H. Joaquin
Whiffletree safety attachment....H. L. Rued
Whistle....F. Strauss
Windmill....A. J. Anderson
Windmill....H. G. Tucker
Windmill....H. H. Macomber (Reissue.)
Window....U. G. McQueen
Window-swinging device....G. H. Parker
Wire-coiling machine....G. B. Smith
Wire-drawing machine....A. Pearson
Wire fabrics, Machine for finishing and selvaging....O. Schmid
Wire or rope tightening clamp....C. L. Larrabee
Wire-stretcher....H. H. and H. C. Harris
Woodworking-machine....J. S. Barnes
Woodworking-machine....W. B. Woodruff
Work-holder....J. J. Ehmann
Wrapping-machine....M. H. Ballard
Wrench....R. Y. Bovee
Wrench, 3 pats....M. E. Layne et al
Wrench....E. C. Carpenter
Wrench....C. O. Morley

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Clock holder or support....L. V. Aronson
Furnace....E. Katzinger
Knit fabric....C. H. French
Medal or badge....C. D. Peck
Stove....G. E. Pickup

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Abrading-machine....A. V. Walker
Account system....E. E. Brunson
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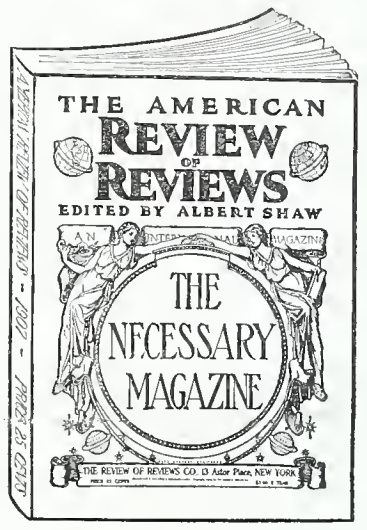
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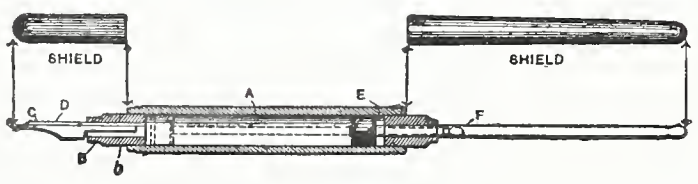
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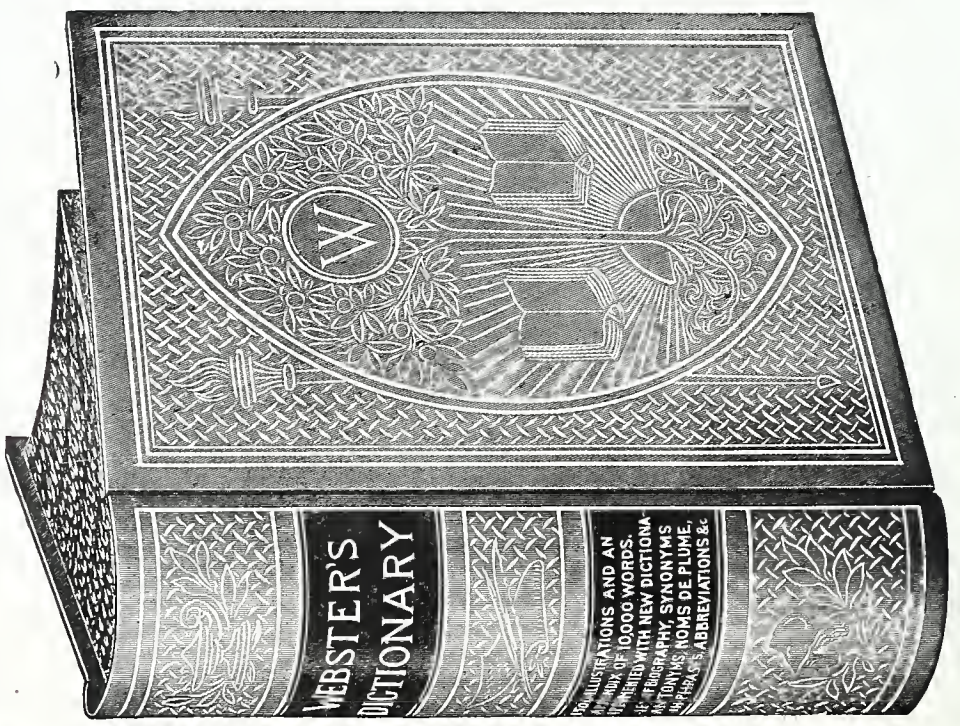


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DIRECT PRODUCTION OF COPPER.

By E. OMMELANGE.

A NEW process for direct production of copper has been recently introduced by a London company, the chief advantages of which are that the copper is refined and manufactured into sheets or tubes in one operation, the copper being of a hard nature, similar to that which is cold rolled; the process is at least ten times faster than any existing electrolytic process; a high current can be employed without injuring the quality of the copper; there is no risk of lamination as no burnisher is employed; the plant is simple, and free from mechanical complications.

It has for years been the aim of copper-refiners to transform crude copper into a smooth product in one operation, by means of electro-deposition.

To directly produce tubes, sheets, wire, and other finished articles, it is necessary to greatly increase the rate at which the copper is deposited, as compared with the rate at which copper can be electrically refined; otherwise the capital outlay on the plant is so heavy as to render the process too costly for practical purposes.

The conditions that are necessary to enable copper to be quickly electro-deposited can be summarized as follows:—

First, the electrolyte must be rapidly circulated so as to prevent the loss of its copper ions in proximity to the cathode. Second, no metal other than copper must be deposited. Third, the electrical resistance must be kept low.

The ideal electrolyte would be one that is chemically inert as a solvent, but capable of dissolving copper electro-chemically, and having a low specific electrical resistance. These conditions have, so far, been met by the use of an acidulated copper-sulphate solution, which, though far from ideal, is cheap, and is capable of producing exceedingly pure copper from comparatively impure copper. It has been estimated that the resistance of the circuit is approximately as follows: 15 per cent metallic resistance; 60 per cent electrolytic, including the transfer resistance: 20 per cent due to poor contacts, and 5 per cent due to counter electromotive force.

Various attempts have been made from time to time to further increase the current density by using mechanical means for keeping the copper smooth during the process of deposition. The best known of these are the Elmore process, (which employs an agate burnisher which continually traverses the surface of the copper being deposited) and the Dumoulin process, which employs a sheepskin rubber, the object being to insulate, coating with grease, the raised portions of the copper as soon as it becomes rough, so as to cause the lower portions of the copper to be built up to the same level: the impingement of the electrolyte against the surface receiving the deposit has also been tried.

The new process, known as the Cowper-Coles centrifugal process is distinct from these, in as much as it consists in revolving the mandrel on which the copper is deposited at a high speed. It is found that for a given current density the mandrel must have a certain peripheral speed; the greater the speed the greater the tensile strength of the copper. The result of revolving the mandrel at this

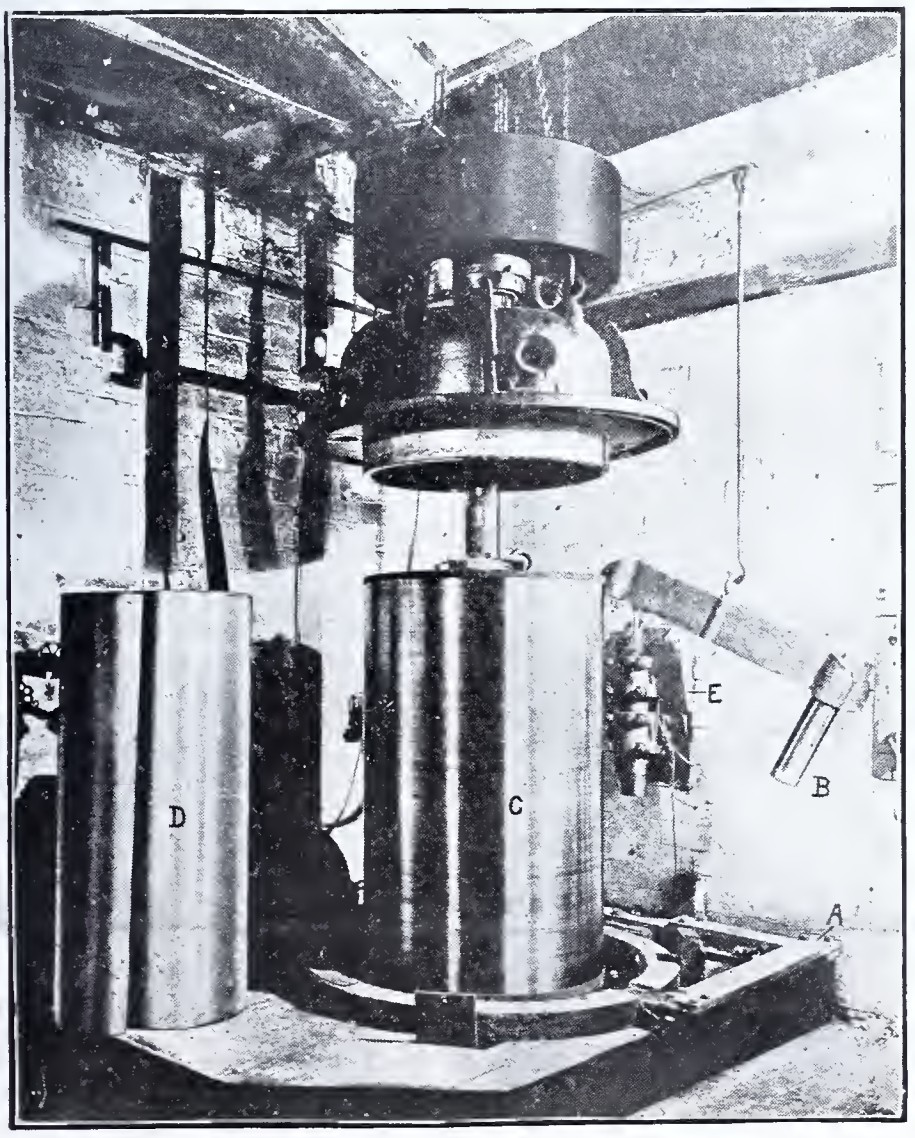


FIG. 1.—PLANT FOR DEPOSITING LARGE COPPER CYLINDERS AND SHEETS.

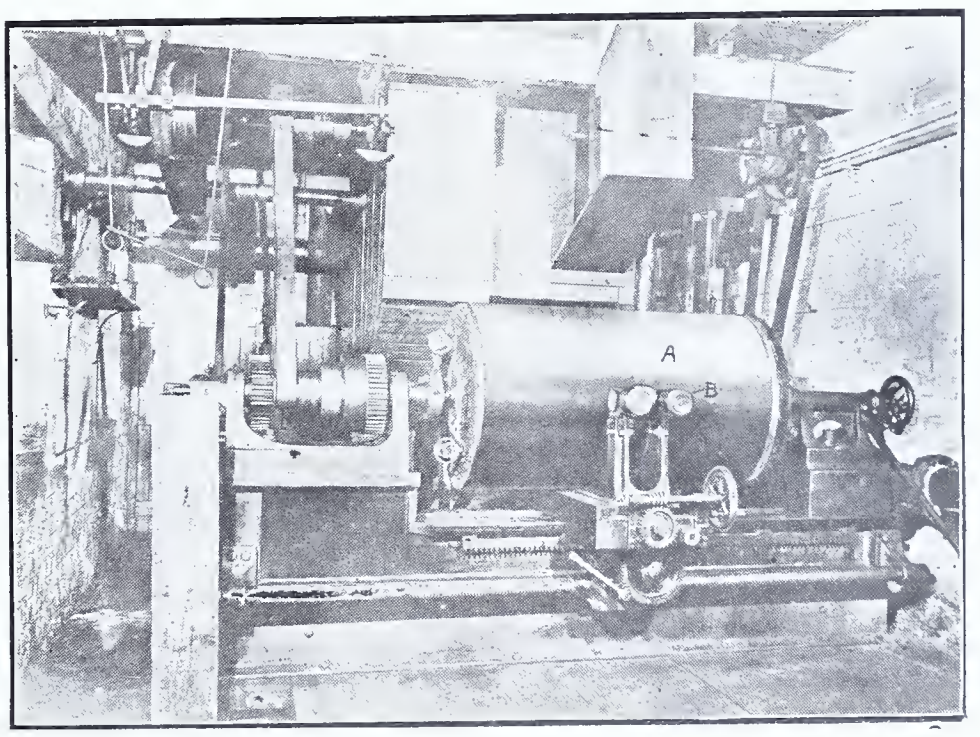


FIG. 2.—APPARATUS FOR EXPANDING LARGE COPPER CYLINDERS.

comparatively high speed is that every molecule, as it is deposited is burnished or rubbed down so as to produce a tough fibrous copper. This reverses the usual order of things, the present practice being to treat the mass of copper, instead of treating each molecule as it is deposited. Centrifugal action plays an important part in this process, as it enables very impure solutions to be used—that is, solutions containing a considerable amount of foreign matter in suspension—as the impurities are thrown off by centrifugal force and by the rubbing action of the electrolyte, this preventing the formation of any nodules.



FIG. 3—COPPER DEPOSITING ON REVOLVING CONE.

In order to determine the proper speed for varying conditions, a revolving cone is employed as seen in Fig. 3. The nature of the copper varies according to the peripheral speed; at the smallest diameter the copper is rough and brittle, at the largest it is smooth and tough.

A recent application of the process is the production of large copper cylinders for printing purposes, in connection with the textile industry. A plant for such a purpose is shown in Fig. 1., and consists of a highly polished mandrel C, corresponding to the internal dimensions of the finished cylinder or continuous band that is to be produced. When it is desired to produce a sheet instead of a cylinder, an insulating strip is put down the side of the mandrel. A copper sheet D thus produced is shown standing on the left-hand side of the vat. The mandrel, or cathode, is driven at the desired speed by means of a belt and pulley; the anodes are cast copper, suspended on a copper ring. the current being led to them by means of the conductors A. The cathode connection is made by means of a mercury cup placed on the top of the driving spindle, and the arm B, which fits on to the top bracket.

The cylinders are made quite thin—about 1-32 of an inch in thickness—and are expanded on specially constructed lathes, as shown in Fig. 2: a roller B is caused to traverse the surface of the deposited copper A, so as to slightly stretch or expand it. After the roller has passed over the copper once or twice, it is found that the cylinder can be easily drawn off.

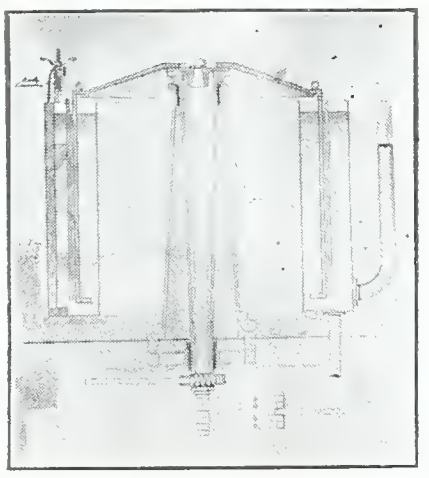


FIG. 4.—DEPOSITING VAT.

Another point of particular interest about the Cowper-Coles process is the method of making wire or strip. An apparatus for effecting this is shown in Fig. 4. The vat employed is annular in construction, which has advantages that there are no working parts in the acid electrolyte, that the mandrel can readily be withdrawn, and that the amount of electrolyte required is greatly reduced. Such a vat is capable of making wire three or four miles in length. The mandrel for the productiou of wire has a fine spiral scratch on the surface; this scratch is angular, not of a rounded section, otherwise the copper will not divide. The effect of this scratch is to alter to crystalline structure of the deposited copper, and form a line of cleavage similar to those formed in cast metals, with sharp angles. The copper is deposited in the usual way, but when the end has once been started, it can be unwound in a continuous strip, as shown in Fig. 5.

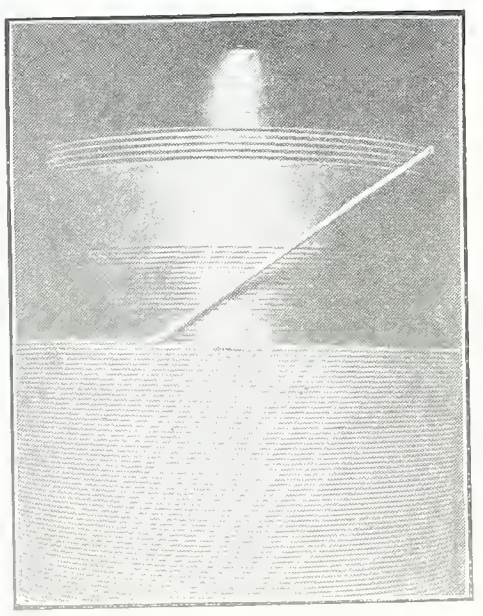


FIG. 5.—UNWINDING COPPER STRIP FOR WIRE.

Copper obtained by this process has a remarkably high tensile strength. Copper tubes without drawing have been given a maximum stress of 17 tons, and a tube after drawing has stood a pressure of 3000 lbs. per square inch—(thickness of metal, 0.063 inch)—without showing any signs of injury: and sheets, without rolling, have borne a maximum stress of from 28 to 34 tons per square inch.

Radium Makes Jewels.

The dream of alchemy has been realized in the discovery by a French scientist of a process by which corundum spar may be converted into rubies, sapphires and other gems by the action of radium. It is generally known that all these gems are in composition crystalized alumina, called corundum or adamantine spar, but through long exposure to varying conditions of heat and pressure during the slow cooling and development of the earth's surface, they have assumed different colors, to which the names of ruby, topaz, etc., have been given. The discovery of radium revealed the active agent through which various changes in certain substances, which had hitherto been of slow progress, might be intensified and accomplished in a comparatively brief time.

The present discovery, according to our Consul General at Paris, was suggested by the fact that the minute glass tubes in which radium is kept for scientific use, take on gradually a beautiful azure color resembling the sapphire. This has been attributed to the presence of minute traces of manganese in the glass, which the marvelous projective power of the radium reveals and revives with varying grades and tints of coloration. Professor Bordas, of the College of France, placed crystallized corundum of several tints in contact with minute tubes of radium, laid them away in a dark place not subject to changes of temperature, and found after a lapse of several weeks that the white corundum had become yellow like the topaz, the blue crystals had become green like emerald, and the violet had turned to blue like the sapphire.

Thus was overthrown the theory held hitherto by scientists, that each of these precious stones has its own special coloring oxide, and that these several oxides—green. blue, red or yellow—have no definite relation to each other. Professor Bordas took his new gems to a leading jeweler, from whom he had purchased the corundum crystals, and they were tested and found to have been converted into a topaz, a ruby and a sapphire, which fulfilled all the tests and requirements of natural stones.

He then obtained from the same jeweler a new series of corundum crystals in pairs, each pair of an exactly similar color. One stone of each pair was exposed for a month to the action of radium, the other retained for comparison, and the result of this second experiment was the same as before. The light reddish corundum, valued in commerce at about 50 cents per carat, had been converted into a ruby valued at a hundred or a hundred and fifty dollars per carat. The dark red corundum became a deep brilliant violet, the violet amethyst had become a sapphire, and the bluish corundum a topaz.

The possible effect of this discovery upon the trade in precious stones can be readily inferred. Radium is as yet one of the rarest and most valuable substances known to science, but the duration of its power is practically unlimited, and since the hundredth part of grain is enough to convert several corundum crystals into precious stones within the space of a month, and this process may be repeated indefinitely with the same speck of radium, it may be assumed that this latest discovery has an important industrial value and may lead to serious modification in the prices of certain gems. Professor Bordas, however, regards his discovery as a mere laboratory experiment, and disclaims any intention to secure for it a commercial value.

Milking by Machinery.

As machinery has transformed the processes of cultivating crops and other agricultural operations so mechanical milkers are now taking the place of the tedious hand methods. Early efforts along this line took the form of an exhaust pump, with rubber cases applied to the teats, the milk being drawn away by suction. The procedure was supposed to exactly duplicate the action of the calf in suckling. Experience, however, soon showed that this apparatus brought about an inflamation of the skin, owing to lack of proper blood circulation during the process. Then the milk, running from the cow to an enclosed pail, failed to come in contact with the air, and the lack of aeration made it unsuitable for use for butter or cheese. Finally a pulsator was tried, and the problem was solved. The pulsator is attached variously in different systems, but it is always placed either on top of the pail or directly on the milking tube. It is a simple automatic piston, held in place by a spring which is carefully adjusted according to the vacuum developed by the pump. The vacuum being formed, the milk is drawn from the teat, and at the same time the piston of the valve is forced up against the spring by the natural air pressure of 15 pounds to the square inch. Attached to the valve piston is a rod, which actuates a small slide covering two small holes. As the piston moves forward the slide uncovers these holes, outside air rushes in, the vacuum is destroyed, and the milking ceases for an instant exactly the same as in hand milking. Then the spring behind the piston forces the latter back to its normal position, the slide covers the air holes, the vacuum is formed anew, and the movement begins again.

Mechanical milkers are not unpleasant or injurious to cows, and it is often possible to use them on animals which are not accustomed to the apparatus, without the least resistance on the part of the cow. By this method, five or six cows can be milked in less than an hour.

THE INVENTIVE AGE contains sound advice to inventors and patentees. For lack of such advice many have lost money. Subscription price, one dollar a year.

Compressing Air by Water.

The most simple and practical method of producing compressed air—a method that possesses twice the efficiency of a reciprocating compressor, and costs only a fraction of that machine—is by employing falling water. This process is in active operation in Connecticut and also in Quebec. Water is carried in a large pipe on a slight slope to the edge of a vertical pipe of any desired length. It is then allowed to fall down this pipe. An annular hollow ring with a large number of fine points on the lower side is immersed in the water at its entrance, and this is connected with a pipe to the outside air.

The water flowing by these holes carries with it small bubbles of air, which are compressed as the water rushes down the pipe. If the water is suddenly turned at the bottom into a reservoir, it comes to rest and the bubbles rise to the surface, under pressure. A pipe carries the water from this reservoir to the surface. The difference of level of the inflowing and outflowing water need only be a few feet in order to produce rapid flow, and the pressure obtained depends simply on the depth of the hole. The pipes are so arranged that the inflowing pipe is inside the outflowing conduit, so that only one hole is necessary. The reservoir at the bottom is merely an enlargement of the hole, and is generally lined with metal.

The operation is simple. Air collects in the lower reservoir, which is connected by a pipe with the upper ground, and can be drawn off under pressure, as desired. When the reservoir becomes full the machine automatically relieves itself, the surface of the water in the reservoir being lowered to the entrance of the outflowing pipe and the excess of air being thus automatically carried off with the outflowing water. It requires absolutely no attention, and compressed air can be obtained in any quantity, the amount depending simply on the amount of water rushing through the penstock and its speed.

Wireless Improvements.

Valdemar Poulsen, who it will be recalled is the inventor of the low-tension, continuous current as applied to wireless telegraphy, which does away with the explosive sparks of the Marconi system, has improved his wireless machine by attaching an ink-writing apparatus to the receiver. This writes the messages automatically, and the record is quite equal to that of the machines used, for example, to print mechanically the messages transmitted by cable from Paris to London. It can be used without telegraphists being present.

This latest device, Mr. Poulsen says, makes his system complete and ready to compete with the cables. He claims that the new method occupies less time than the cable, the rate of transmission averaging twenty-two words a minute. The reproduction is most reliable.

INCUBATING CHICKS BY ELECTRIC CURRENT.

By Frank C. Perkins.

Some novel devices for hatching chickens by utilizing electricity to provide the necesary heat are seen in the accompanying illustrations.

One heater is so arranged as to be easily placed in any of the ordinary incubators in use throughout the country, its purpose being to supply electric heat in place of oil, at the same time not in any way interfering with the use of the incubator should oil fuel be desired. By means of this device all of the disagreeable features of oil incubators are avoided, there being no fumes, smoke or offensive odors.



FIG. 1.—ELECTROBATOR.

The Electrobator (Fig. 1.) is a purely electrical incubating device and therefore differs from the attachment described. In the upper part of the electrobator is located a heater similar to that above mentioned, equipped with a thermostat for controlling the temperature and maintaining the same constantly at 103 degrees Fahrenheit. This thermostat is very sensitive and delicate in adjustment, there being a variation of only a fraction of a degree at any time in the electrobator. An electric condensor is provided and placed in parallel with the terminals of the thermostat so as to avoid sparking at the contacts, which are of platinum.

The Electrehen (Fig. 2.) was designed and constructed by the writer for use in nature study in schools and kindergardens, the electric lamp providing all of the necessary heat for incubating the eggs and for brooding the chicks after they have been hatched. It is only necessary to connect the machine, which is an oval glass case mounted on a gun-metal or oxidized copper base, with a flexible cord and plug to any electric lighting circuit, either alternating or direct current of 110 volts pressure, in order to be ready for operation. By turning the switch of the incandescent lighting socket, sufficent current is provided for maintaining the proper temperature in the egg tray for hatching and brooding the chicks. The eggs lie in a nest surrounding the incandescent lamp which is of the round bulb pattern of 16 candle power. This device works satisfactorily day and night without the slightest attention, as the current maintains practically a constant temperature. A drawer is provided, which is partly drawn from the base, and the electric chicks run about in the fenced inclosure, about three or four feet square. Electric incubation on a large scale is thoroughly practical, and undoubtedly will be utilized to advantage in the country as well as in the city where current is available.

This form of load is very attractive for the electric lighting companies, and the rates obtainable are as low as for power and heating purposes. The service being for 24 hours per day and for 21 days continuous run for each hatch, it is most desirable from the central station point of view.

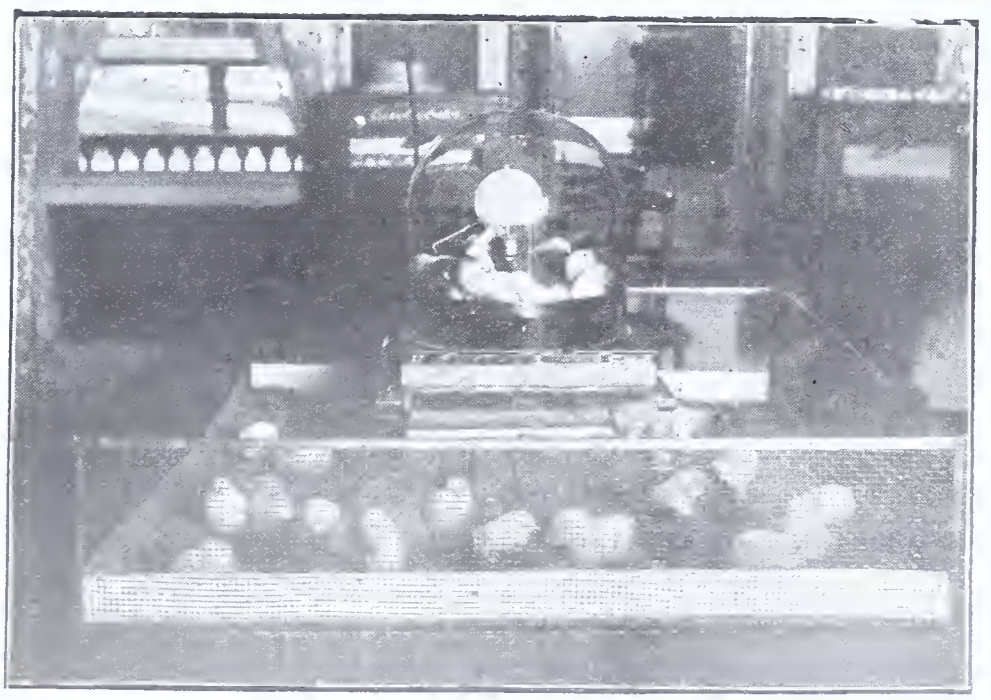


FIG. 2.—ELECTREHEN.

There is also an electric [illegible] designed to take care of [illegible] hatching. The temperature is maintained at 10 degrees to [illegible] degrees for the first week, and after the chicks are older the regulator is adjusted at from 80 degrees to 87 degrees, and finally the artificial heat is dispensed with entirely.

New Source of Ammonia.

The latest use for peat has been found to be in the production of ammonia, which is effected by passing a mixture of air and water vapor over peat kept at a low grade of heat in specially devised furnaces. The great difficulty in the commercial employment of peat has always been the quantity of water it contains, which averages 90 per cent. The new method overcomes this difficulty, and demonstrates that a minimum yield of 5 per cent of sulphate of ammonia can be obtained from the bog. The chief products of the process—ammonia and paraffin tar—have a practically unlimited market, and the opening for acetic acid, acetone, etc., is constantly growing. Enormous quantities of the latter are used by manufacturers of smokeless powder. The ash of peat, also, is salable as a cheap fertilizer, as it contains potassium salts, lime and phosphoric acid.

In this new process, says our Consul at Birmingham, the peat is fed into hoppers worked by compressed air, and then dropped into the furnaces. Here it is subjected to moist combustion by means of a blast of air charged with water vapor at a regulated temperature. The resulting gases contain paraffin tars, acetic acid, and ammonia. The paraffin tars are removed by the scrubber, which retains all tarry matter without causing any condensation and consequent loss of ammonia. The acetic acid is next absorbed in an alkali tower, where the gases meet a hot solution of soda and combine with it to form acetate of soda, which may afterwards be treated for the recovery of acetic acid. The gases pass to the acid towers, where they meet a stream of hot sulphuric acid, which combines with the ammonia to form sulphate of ammonia, the chief object of the process. This is concentrated, and allowed to crystallize, and after the removal of adherent liquor, is ready for shipment.

A Wild Textile.

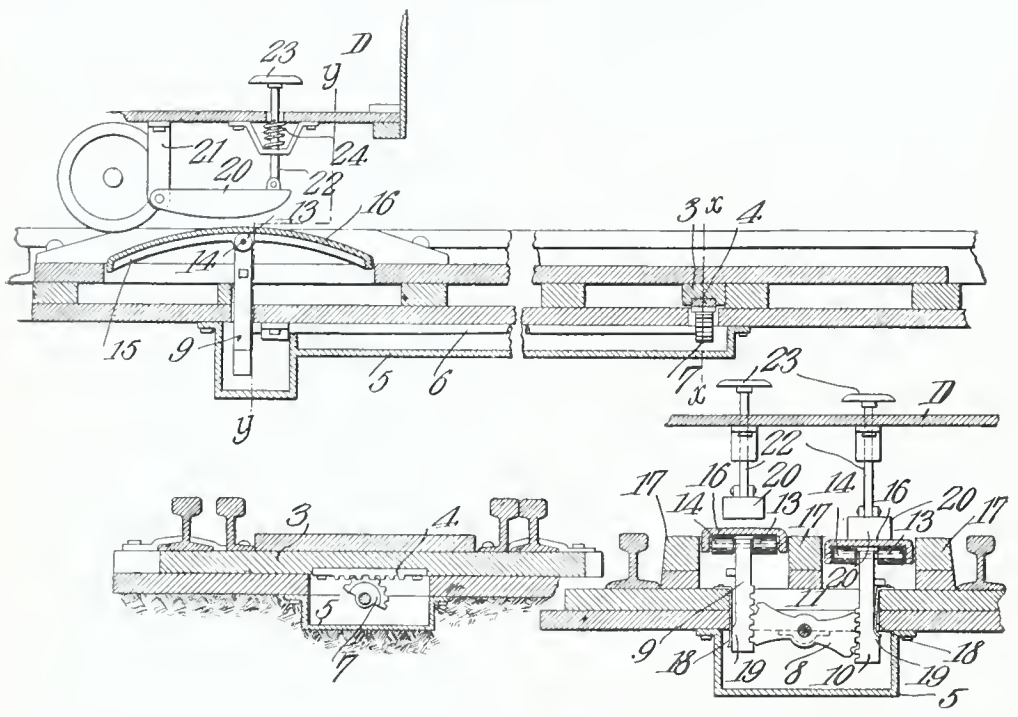
The tropics have again yielded a novelty, in the shape of a wild silk which has been discovered in the region of the East African lakes. The cocoons are enclosed in numbers of from 50 to 800 in a thick nest, the material of which consists of pure silk fiber. The caterpillars live on the leaves of the trees which grow in this country, and besides the cocoons, these caterpillars give with each spinning a large quantity of superior material for spun silk. The cocoons can be unwound in a single thread if care be taken in the process, and the silk can be bleached white, differing in this respect from other wild silks, such as tussah.

CLEVER NEW PATENTS.

RAILWAY SWITCH.—WINDOW BLIND.—CAR DOOR FASTENER.—DINNER PAIL.—CROSS HEAD PUMP.

Railway Switch.

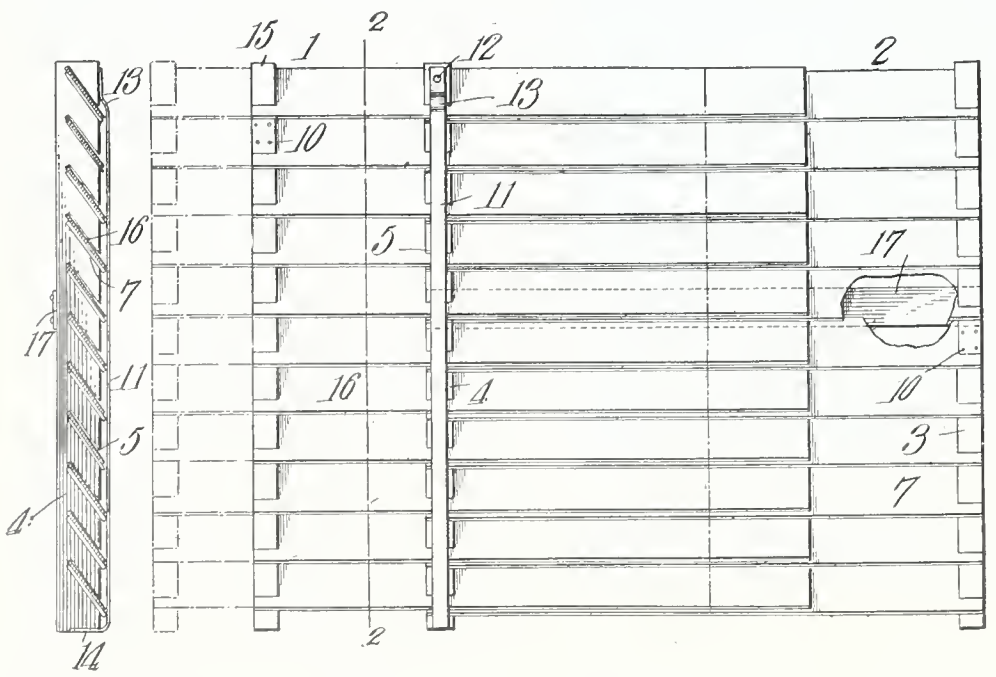
An improved railway switch is the subject matter of a patent recently secured by Calvin F. Christopher, of Ashville, N. C., and has for its object to provide a railroad switch of that type designed to be operated by a car approaching the switch, the car being provided with means whereby the switch can be shifted so as to direct the car onto either track. In the accompanying illustrations switch tongues are mounted at the usual points and are connected by the cross bar 3. A rack bar 4 is secured to the lower face of bar 3 and directly above one end of a casing or trough 5, and disposed longitudinally



between the rails of the main track. Journaled within this trough or casing is a shaft 6 having a segmental gear 7 at one end which meshes with the rack bar 4. The other end of the shaft is provided with a large segmental gear 8 interposed between, and meshing with vertically movable rack bars 9 and 10. Rollers 13 are connected to, and extend laterally from, the upper portion of each rack bar 10, and the pivots 14 thereof project into the flanges 15 of depressible members 16. The car D carries mechanism for actuating either of the members 16 so as to shift the switch tongues in either direction. This mechanism preferably consists of two shoes 20 supported at one end by hangers 21, while the other end of each shoe has an operating rod 22 that is provided with a head 23.

Window Blind.

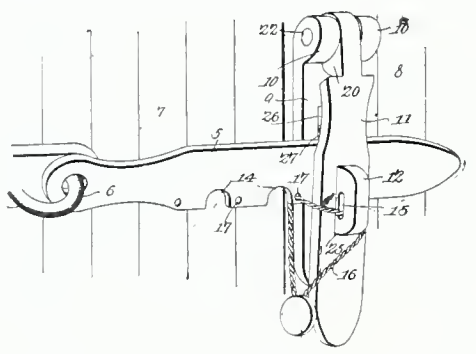
An improved window blind, which renders it posible for a house-holder to air the house during his absence without being subject to worry from fear that rain will beat in the windows, has been patented by George P. Mitchell, of Galva, Illinois. The blind comprises two sections designated 1 and 2. The latter section is composed of a stile 3 and a guide 4, each of which is provided with obliquely disposed slots or seats 5 and 6 to receive the slats 7 which are secured to the stile in any preferred manner. The guide 4 has combined with it a keeper 11 of metal that is secured at its upper end 12 to the



guide, thence deflected laterally to afford space for the slats to move. Section 1 of the blind embodies a stile 15 of the same construction as the stile 3. The slats are adapted to overlie the slats 7 of the section 2, and to work in slots 5 of the guide. Thus it will be seen that the two sections 1 and 2 may be readily adjusted so as to fit any size window frame, and further that the blind may be placed under the lower sash or above the upper sash as may be preferred, and will positively secure the objects sought.

Car Door Fastener.

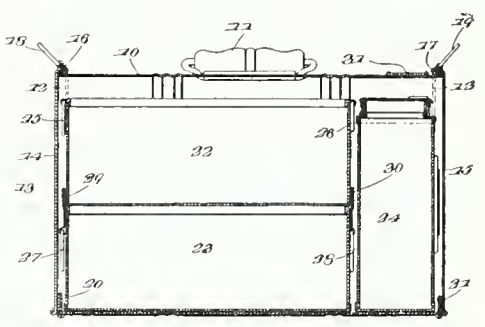
An improved car door fastener has recently been patented by George Lighthiser, of Toledo, Ohio; and has for its object to provide a fastener having an improved means for holding the pivoted locked latch in an elevated or inoperative position preparatory to releasing the hasp. As



shown by the accompanying illustration, the fastener comprises a hasp 5 pivotally mounted on a staple 6. Secured to the door frame of the car is a securing plate 9, one end of which is bifurcated to form a pair of spaced lugs 10 between which is pivotally mounted a locking latch 11 that is provided with an elongated slot 25. Extending laterally from the plate 9 is a lug 12 which is provided with an elongated slot 15, said lug being adapted to pass through the slot 25 of the latch 11. A wire 16 is adapted to engage the slot 15, and an opening 17 in the hasp, and is provided with a terminal seal or fastening device 18.

Dinner Pail.

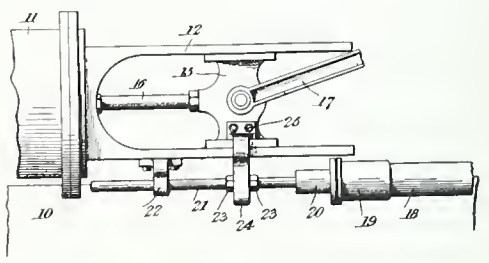
An improved dinner pail that is particularly adapted to be employed by mechanics and other workmen has been recently patented by Wilhelm N. Stephan, of Olean, N. Y., and has for its object to provide an inexpensive device whereby the contents are pro-



tected from dust, cinders, etc., and wherein the different receptacles are accessible and removable without disturbing or exposing the other receptacles. As shown by the accompanying illustration, the device comprises a casing 10, which is opened at the ends. The side edges of the open ends are provided with outwardly extending ribs 12, which are adapted to receive guide channels 13 upon closure members 14 and 15, by means of which the closures are slidably disposed upon the casing. Food receptacles 22 and 23 are arranged one above the other within the casing 10, and each is adapted to be withdrawn separately. As these receptacles are shorter than the casing, room is made at one end of the casing for another receptacle 24 adapted especially for coffee, tea or other liquids. By this arrangement, the coffee can be removed without exposing the food receptacles or disturbing them in any manner or vice versa.

Cross Head Pump.

Messrs James G. Fairbanks and George L. Sauer, of Marion, Ohio, have secured a patent for an improved cross head pump of that type generally employed as boiler feeders, traction engines, agricultural machines, etc. In this invention provision is made for allowing perfect freedom of movement of the cross head, and any adjustment which may be necessary without danger of any injury to the pump. The boiler 10 supports the cylinder 11, and the cross head guides



12 in the usual manner, and between these guides plays a cross head 15 forming a connection between the piston rod 16 and the connecting rod 17. Below the cross head is arranged a feed pump cylinder 18, in which is arranged a reciprocating plunger 20, the rod 21 which is extended toward the forward head of the cylinder 11, and is supported in a guiding bracket 22. On the rod 21 are secured two rigid collars or nuts 23 betw een which fits the bifurcated lower end of an operating arm 24. The upper end of this arm is secured to the cross head by bolts 25 or other suitable means. As will be readily seen by reference to the illustration, the length of the space between the bifurcated arms at the lower end of the arms is sufficient to allow its movement without without danger of any binding action between the arm and the plunger rod, so that there will be no transverse stress on the plunger rod, and no tendency to uneven wear or undue friction from following the movement of the cross head.

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

INTERNATIONAL TIME RECORDING CO. v. W. H. BUNDY RECORDING CO.

(Circuit Court, N. D. New York. April 17, 1907. 152 F. R. p. 717.)

PATENTS—INFRINGEMENT—WORKMEN'S TIME RECORDER.

The Cooper patent, No. 528,223, for a workmen's time recorder, was not anticipated, and is valid as to claims 1, 4, 5, 7, and 10. Claims 5, 7, and 10 are limited to a construction in which the abutment which limits the movement of the card is intermittingly actuated by the time mechanism, and are not infringed by a device in which the abutment is moved by the hand of the operator. Claim 4 contains no such limitation, and any intermittingly operated mechanism is within its terms. In claim 1 a card guide or receiver adjustable relatively to the stamp is made by the language of the claim an essential element, and it is not infringed by a construction in which such receiver is stationary and the stamp and its actuating mechanism are movable.

POWERS REGULATOR Co. v. NATIONAL REGULATOR CO.

(Circuit Court, N. D. Illinois, E. D. March 15, 1907. 152 F. R. p. 984.)

PATENTS—VALIDITY AND INFRINGEMENT—HEATING AND VENTILATING APPARATUS.

The Powers patent, No. 558,610, for improvements in heating aud ventilating, which consist of a heating and ventilating apparatus wherein double dampers controlling separate ducts for hot and cold air are held in mixing position by a gradually-acting thermostatically-controlled motor, the purpose being to automatically regulate the temperature of the air discharged into a room through a single pipe, was not anticipated and discloses invention, the device shown differing from anything in the prior art, in that the dampers are moved gradually, and not by steps from one fixed point to another; and in such respect the invention is so far a pioneer in its particular field as to entitle the patentee to claim the use of any of the well-known gradually-acting thermostatic devices in the same combination as equivalents. As so construed, held infringed.

DEERE & WEBBER CO. v. DOWAGIAC MFG. CO.

(Circuit Court of Appeals, Eighth Circuit. April 1, 1907. 153 F. R. p. 177.)

1. PATENTS — SUIT FOR INFRINGEMENT—PLEADING.

Under the rule that answers in equity must be full, unequivocal, and responsive to the bill, where a bill for infringement of a patent alleges past aud present infringement, and that defendant then had on hand a large number of infringing machines which it was offering for sale, an answer which admits that defendant had previously sold a machine which had been adjudged an infringement, but alleges that it had ceased selling the same "long prior" to the beginning of the suit and returned the parts on hand to the manufacturer, and since "that time" had sold no machines of that character, is indefinite and evasive and not responsive, aud must be treated as admitting the averment that defendant had infringing machines on hand which it was offering for sale.

2. SAME—DISCLAIMER OF INTENTION TO INFRINGE WHEN SUFFICIENT TO AVOID INJUNCTION.

Where the answer in a suit in equity for infringement of a patent denies the validity of the patent, and asserts the right of defendant to make and vend the machine covered thereby, and also by implication admits an allegation of the bill that it has on hand and is offering for sale a large number of infringing machines, a mere averment that it ceased selling an alleged infringing machine prior to the commencement of the suit, and has no intention of using or selling any machines embodying the features of the patent, not supported by any clear proof, is not such a disclaimer as will deprive the complainant of the right to an injunction.

3. SAME—INFRINGEMENT—GRAIN DRILLS.

The Hoyt patent, No. 446,230, for a grain drill, held valid and infringed.

WILLS v. SCRANTON COLD STORAGE & WAREHOUSE CO.

(Circuit Court of Appeals, Third Circuit. April 30, 1907. 153 F. R. p. 181.)

1. PATENTS — INVENTION — REFRIGERATOR BUILDING.

The Wills reissued Patent, No. 12,300 (original No. 742,540), for a refrigerator building the essential feature of which is the use of flaps or other devices for closing the space between the elevator car and the sides of the shaft to prevent the escape of cold air from the refrigerating rooms when the elevator is in use, is manifestly void on its face for lack of inventiou.

2. SAME—SUIT FOR INFRINGEMENT—PATENT INVALID ON ITS FACE.

Where the invalidity of a patent for lack of invention is clear upon its face, the court may so declare it sua sponte, although the question is not raised by the pleadings, and may dismiss a bill for its infringement.

NATIONAL ENAMELING & STAMPING CO. et al. v. NEW ENGLAND ENAMELING CO.

(Circuit Court of Appeals, Second Circuit. March 1, 1907. 153 F. R. p. 184.)

PATENTS—VALIDITY AND INFRINGEMENT—ENAMELING METAL WARE.

The Claus patent, No. 527,361, for an improvement in enameliug metal ware, held void as to claims 1, 2, and 3, and uot infringed as to claims 9, 10, 11, and 12.

DODGE NEEDLE CO. v. JONES.

(Circuit Court, E. D. Pennsylvania. April 3, 1907. 153 F. R. p. 186.)

1. PATENTS—CONSTRUCTION—PROCEEDINGS IN PATENT OFFICE — RETRACTED DISCLAIMERS-FINAL FORM OF APPLICATION.

Where, upon application for a patent for a pivoted pin of a knitting machine needle, at the outstart of the proceedings in the Patent Office, the applicant, for the purpose of distinguishing certain references, made positive and reiterated declarations as to the headless character of the pins, but later was prompted to file a new and completely revised application, as a continuation of the proceedings, iu which there were claims for a headed, as well as a headless, pin, the specifications being changed to correspond, which the examiner allowed and passed, although as the result of interference proceedings the headed claims were subsequently canceled, the patent (aside from the effect of the cancellation) is not limited, by such earlier declarations, to a headless pin; both specifications and claims, as allowed, being broad enough to include a headed one, and the final form in which the patent is cast being the one to be taken in determining the scope of the invention, which stands as it was asserted and accepted at the close of the proceedings, regardless of what had been delcared previously.

2. SAME — INTERFERENCE PROCEEDINGS — CANCELLATION OF CLAIMS AFTER.

Where, however, interference proceedings with another party have been declared, as the result of which he is found to be the prior inventor of the headed form of pin, aud thereupon the applicant for the patent in suit cancels the claims covering this form, and takes out a pateut without them, he is precluded thereafter from asserting a right to anything but a headless pin, not because priority of invention was found in favor of the other pateut, which may not be conclusive, but because by his own direct act, in response thereto, he canceled his claims for headed pins and accepted a patent in this restricted shape.

3. SAME—PRIOR PUBLIC USE—PUBLIC USE PROCEEDINGS—EEFECT OF.

The patentee having been defeated in interference proceedings as to one form of device, priority of invention being found in favor of the other party, at his instigation, in order to defeat the right of such party to a patent, public use proceedings were instituted, in which it was shown that for over two years prior to the time to which such party could carry back his invention this form of the device had been manufactured and used by the company where the patentee was employed. Held that, while this showing was fatal to the right of the other party to a patent, it did not change the status of the patentee, or restore his rights to the device as in fact the prior inventor; his own patent having been already taken out after he had canceled claims covering this form.

4. SAME—KNITTING MACHINE NEEDLE—INFRINGEMENT.

The Currier patent, No. 743,152, for a knitting machiue needle, if broad enough in terms to cover both a headed, as well as a headless, form of pivot pin, was anticipated as to the headed form, which cannot, therefore, be claimed; and as so limited, held not infringed.

5. SAME—STRUCTURAL FORM—METHOD OF MANUFACTURE.

Semble, that where a patent is not for a product, the result of a method or process, but for an article of special mechanical structure, the method of manufacture can not euter into it as a patentable element.

CONSOLIDATED RY. ELECTRIC LIGHTING & EQUIPMENT CO. v. ADAMS & WESTLAKE CO.

(Circuit Court, N. D. Illinois, E. D. March 15, 1907. 153 F. R. p. 193.)

PATENTS—VALIDITY AND INFRINGEMENT—MECHANISM FOR ELECTRIC LIGHTING OF CARS.

The Kennedy patent, No. 740,982, for mechanism for driving dynamos on railway trucks for the purpose of the electric lighting of cars, the esseutial new features of which are a removable cradle having therein a block upon which the dynamo is pivotally mounted, and which is adjustable to secure parallel alignment with the car axle, covers a combination which is an advance upon the prior art, and discloses invention; also held valid as against the claim of prior use, and the owner held entitled to an injunction to restrain infringement.

CUTLER-HAMMER MFG. CO. v. AUTOMATIC SWITCH CO. OF BALTIMORE CITY et al.

(Circuit Court, S. D. New York. July 25, 1906. 153 F. R. p. 197.)

PATENTS-INFRINGEMENT-ELECTRIC SWITCH.

The Blades patent, No. 453,032, for an automatic switch mechanism for an electric motor, construed and held not infringed.

DAYTON MALLEABLE IRON CO. v. FORSTER, WATERBURY & CO.

(Circuit Court, N. D. Illinois, E. D. March 15, 1907. 153 F. R. p. 201.)

1. PATENTS—VALIDITY—COMBINATION.

Under the modern rule, it is uot necessary, in order to constitute a patentable combination, that each element should directly coact upon each of the others to produce the result, but, where all are uecessary to obtain the desired end, a combiuatiou may be implied.

2. SAME — INFRINGEMENT — FIFTH WHEEL FOR VEHICLES.

The Morrill patent, No. 578,576, for a fifth wheel for vehicles, while of narrow scope in view of the prior art, discloses pateutable novelty and inveution, and is valid; also held infringed.

LORAIN STEEL CO. v. NEW YORK SWITCH & CROSSING CO.

(Circuit Court, D. New Jersey. April 15, 1907. 153 F. R. p. 205.)

1. PATENTS-SUIT FOR INFRINGEMENT-RIGHT TO RECOVER DAMAGES AND PROFITS.

Under Rev. St. § 4900 [U. S. Comp. St. 1901, p. 3388], which makes it the duty of a patentee to give notice of his rights by marking the patented article, and precludes the recovery of damages for infringement, except on proof that defendant was duly notified of the iufringement and continued to infringe thereafter, the burden rests on the complainant, in a suit for intringement, to allege and prove such notice either to the public generally by such marking of the patented article, or by direct notice to the defendant, and in the latter case neither damages nor profits are recoverable except for infringements after such notice was given.

2. SAME—NOTICE OF INFRINGEMENT.

Where a bill for infringement of a patent admitted that complainant had made and vended the patented articles without any averment that they were marked, as required by Rev. St. § 4900] U. S. Comp. St. 1901, p. 3388], but alleged that defendant was notified of its infringement, and continued to infringe thereafter, without, however, giving the date of such notice, an admission of such notice by defendant by failing to deny it in the answer did not relieve complainant from the burden of proving the date, and, where that question was not adjudicated by an interlocutory decree finding infringement and directing an accounting, such date must be proved before the master to afford any basis for an accounting.

THOMAS G. PLANT CO. v. MAY MERCANTILE CO.

(Circuit Court, E. D. Missouri, E. D. Feb. 4, 1907. 153 F. R. p. 229.)

1. TRADE-MARKS AND TRADE-NAMES — FRAUDULENT USE BY ANOTHER — INJUNCTION.

A manufacturer of shoes which has adopted and uses the name "Queen Quality" as a trade-mark or name exclusively for its use of superior grade, selected by it aud stamped with such name, is entitled to be protected in such manner of use and to an injunctiou restraining a purchaser of shoes of its manufacture, but which it had rejected for such grade and stamped with a different name, from advertising, offering for sale, and selling the same under the name of "Queen Quality" shoes.

2. SAME — SUIT FOR INFRINGEMENT — INJUNCTION.

Where a defendant continued to make use of complainant's trade-mark after notice to desist and contested a suit brought to compel it to do so, complainant's right to an injunction is not defeated because defendant had, in fact, ceased such use before the suit was brought, which fact was not known to complainant.

UNITED SHOE MACHINERY CO. v. GREENMAN.

(Circuit Court of Appeals, First Circuit. March 27, 1907. 153 F. R. p. 283.)

1. PATENTS—ANTICIPATION—ABANDONMENT OF MACHINE.

A machine fully embodying a device subsequently patented by another does not lose its effect as an anticipation because its use was abandoned, solely for its reason that the product in making which it was employed was not successful, where it is shown that the machine operated successfully, and that the maker did not abandon the invention embodied therein.

2. SAME—CLUTCH.

The Davey & Ladd patent, No. 672,056, for a clutch for starting and stopping machines, is void for anticipation by the clutch previously employed in the Stiles-Thomson machine for setting lacing studs in shoes.

BRUNSWICK-BALKE-COLLENDER CO. et al. v. BACKUS AUTOMATIC PIN SETTER CO. et al.

(Circuit Court N. D. Illinois, E. D. March 15, 1907. 153 F. R. p. 288.)

1. PATENTS—INVENTION—IMPERFECT OPERATION OF DEVICE.

The fact that a patented device, designed for a novel use, does not work perfectly does not deprive it of inventiou where the priuciple is disclosed, and all that is necessary to its perfection is a more perfect or modified mechanical adjustment of parts.

2. SAME—INFRINGEMENT—PIN SETTER FOR BOWLING ALLEYS.

The Crawford patent, No. 644,546, for a device for setting pins in a bowling alley, discloses patentable invention, and is valid. Also held infringed by the device of the Backus patent, No. 771,963.

MOXIE NERVE FOOD CO. OF NEW ENGLAND v. MODOX CO. et al.

(Circuit Court, D. Rhode Island. May 15, 1907. 153 F. R. p. 487.)

TRADE-MARKS AND TRADE-NAMES-SUIT FOR INFRINGEMENT — RIGHT TO RELIEF IN EQUITY.

The fact that the manufacturer of an article, sold as both a medicine aud a beverage, built up its business in part on misrepresentations made upon its labels aud wrappers and in its advertisements respecting the mediciual properties of the article will not debar it from relief iu equity against unlawful imitatiou of its trade-name and unfair competition, where is has permauently discontinued such misrepresentations, and makes only such represeutations as are considered warranted by a substantial amount of medical opiuion.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Olaus B. Jacobs, Cleveland, Okla. Screen for Doors and Windows.—An object of the invention is to provide a device adapted to permit flies to pass readily from the interior to the exterior of the screen, and capable of effectually preventing the return of such insects.

Olaus B. Jacobs, Cleveland, Okla. Fly Trap for Door and Window Screens.—An object of this invention is to equip door and window screens with means for permitting the flies to escape from the interior, and for enabling such flies to be captured and destroyed. Another object of this device is to provide means for directing flies crawling upward on the interior of a screen into an exteriorly arranged collapsible receptacle, adapted to be readily removed from the screen either for baiting or for destroying the captured flies.

Lou M. Corbin, Macon, Mo. Twine Holder.—An object of this invention is to provide a twine holder adapted to be placed on a shelf, or other support, at an elevation and at a point remote from the counter, and capable of ready adjustment to arrange the free end of the twine over the counter, or at any other desired point. Another object of the invention is to provide a twine holder adapted to enable the twine or cord to be freely unwound from a spool or comb without liability of becoming caught or tangled.

Oliver B. Ramp, West Burlington, Ia. Molding Machine.-An object of the invention is to provide a molding machine, of approximately rectangular form, arranged to permit a carriage to be run under it from each of its four sides, and capable of being operated at each side for controlling the pressing mechanism. Another object of the invention is to provide means for enabling the top of the carriage to be supported independently of the body portion, so that when pressure is applied, the body portion will be relieved of the strain incident to such pressure.

Charles S. Waybright, Crabbottom, Va. Churn.—An object of the invention is to enable a rapid alternating rotary motion to be imparted to the dasher, whereby the churn will be capable of quickly producing butter. Another object of the invention is to provide operating means, adapted to be readily adjusted to suit the height of a person without changing the leverage, and capable also of enabling the leverage to be adjusted so that the churn will be easily operated by either a child or adult.

Charles S. Daniel, Melbourne, Wash. Sight for Fire Arms.—An object of the invention is to provide a sight adapted to afford sportsmen a clear white sight at all times and under all conditions of light, and capable of enabling a fire arm to be aimed instantly with the greatest accuracy. Another object of the invention is to provide a sight designed to facilitate rapid shooting, and capable of guiding the eye to the sight notch and of forming a guard for the same without obscuring the target or game. The invention also has for its object to provide a sight, which will not become blurred or indistinguishable in a bright light, and which may be distinctly seen in dark woods, or in the moonlight.

Jason C. Taylor, Willoughby, Ohio. Detachable Screen Door Hinge.—An object of this invention is to provide a hinge adapted to be applied to a door frame or casing without recessing the same, and capable of enabling a door to be easily and quickly hung and conveniently taken down without removing screws, or other analogous fastening devices.

Thomas McCormick, Mt. Pleasant, Pa. Lace Curtain Hanger.—An object of this invention is to provide a lace curtain hanger, adapted to be readily placed on, and moved along, a curtain pole to arrange it in proper position, and capable of securely gripping a lace curtain without injuring the same. Another object of the invention is to provide a lace curtain holder, adapted to be easily operated to suspend a lace curtain from a curtain pole and to disconnect it therefrom, and adapted, when unfastened, to automatically release the curtain to facilitate the ready removal of the latter.

Thomas McCormick, Mt. Pleasant, Pa. Carbureter.—The principal object of this invention is to provide simple and novel means whereby the fuel is properly vaporized before it is introduced into an explosive engine. The means includes a reservoir capable of holding a comparatively great amount of fuel and maintaining it in a harmless condition, vaporizing mechanism being also provided which automatically returns all surplus or unvaporized fuel taken from the reservoir back to the same. The device is simple, and can be applied to any type of engine.

Frank R. Stearns, and Ado D. Skinner, Grand Forks, N. Dakota. Traction Engine.—These inventors have produced an engine of the above type, in which the boiler can be leveled either when the engine is running up or down hill, or when it is stationary upon uneven ground. To this end means are provided whereby the engineer can conveniently elevate or lower one end of the boiler upon the axle, so that said boiler can at all times be maintained in a level position, thus keeping the sheets and tubes submerged and avoiding the danger of their being burned out.

John W. Kuebler, Mankato, Minn. Envelope.—The aim of this inventor has been to provide means whereby the contents of the envelope can be completely withdrawn, and to employ in connection with this withdrawing means, a device that will open the envelope. The envelope is provided with a detachable lining, benind which is arranged a severing and withdrawing cord that also constitutes means for opening the envelope.

James G. Barrett, Williamstown, Mass. Rail Holding Means.—This device is intended to hold railroad rails from creeping, or in other words, moving longitudinally. The device can readily be placed upon a track between the ties and consequently anchored in the ballast, and includes clamping devices and eccentrically disposed jaws that engage the opposite sides of a rail to effectively hold the same.

Charles L. West, Oklahoma City, Okla. Dowel.—The device covered by this patent is more particularly intended for fastening stone monuments to their bases. One of the principal objects is to provide a dowel or tie device that can be readily applied to the members to be secured, will rigidly hold the same together, and is not exposed. It consists of a pair of eyes formed of wire and fastened to one member, a single eye carried by the other member and arranged between the eyes of the first member, and a tapered screw that passes through the eyes and serves to draw the members tightly together.

Harry H. Wilson, Lock Haven, Pa. Garment Supporter.—This device is particularly intended for supporting drawers from trousers. It is made of a single piece of wire substantially in the form of a safety pin that can be attached to the trousers, and has a novel form of depending hook made integral with the pin and arranged to engage the band of the under garment.

William S. Emert, Peoria, Illinois. Draft Equalizer.-The object of the inventor is to provide a simple and practical device whereby a greater number of animals may be located on one side of the line of draft than on the other, without, however, creating or imparting any side draft, the structure moreover being such that the number of animals may be varied without altering the direct, forward, and proper draft through the mechanism to the machine attached thereto.

John H. Priestley, inventor, Richfield, Kans.; John DeFrain, Spencer, Iowa, assignee of one-half interest. Combination Tool.—This patentee has provided a combined hammer, nail extractor, screw driver and threading die, all combined in a simple implement, the parts being so arranged that one co-operates with the other in order that each may perform various functions, and yet when the device is folded, it occupies no more space than an ordinary hammer.

Edwin W. Stevens, Lake Carey, Pa. Nut Lock.—The aim of the inventor has been to provide a novel structure for securing nuts against accidental movement, the structure being such that it can be readily applied, and is itself effectively secured against detachment when in position. Two superposed nuts are employed, both threaded on the bolt and having slots in their abutting faces, these slots alining. A key is employed that is driven into the alined slots, and has an inner tongue that is bent over by engagement with the bolt, thus securing the parts. The bolt on which the nuts are placed is composed of two sections that are oppositely threaded.

William Hughes, Upland, Pa. Plant Support.—Mr. Hughes has produced exceedingly simple means for supporting plants growing in pots and will not injure the bulb or roots of a plant contained therein. It is formed of wire, a lower section being employed that is buried in the earth, and has a clamp engaging over the edge of the pot. Upon its lower section is slidably mounted an upper section, the device thus being extensible to suit the height of the plant with which it is used.

John A. Gyllenberg, Baker City, Oregon, inventor; Coupling Device for Tramways and the like. Baker City Iron and Supply Co., of the same place, assignee of entire right. The structure, which constitutes the subject-matter of this patent, is particularly intended for connecting buckets and other devices to the cables of aerial tramways, and the object is to provide a simple member that can be readily applied to, and detached from, any portion of an ordinary cable. It consists substantially of a plate having a cross bar or core with wings on opposite sides of the same, these wings being made to conform to the twist of the cable. In use, the core is introduced into the cable, a section of the latter being cut out, and the strands of the cable engage on opposite sides of the wings.

Paul A. Uzel, Nashville, Tenn. Curtain Shade Cutting Machine.—The machine covered by this patent is for accurately cutting window shades from the roll of material. On one side of a bed plate is arranged a holder for the roll of material. On the other side is placed the curtain roller. A transversely operating cutting and creasing device is mounted to move over the bed plate and sever the material placed thereon, and at the same time form the necessary creases in it. The device is adjustable to cut shades of different widths.

Liberty Millet, Hagerman, Idaho. Wall Structure.—The design in this invention is to provide a concrete or cement wall that is strong and durable and is efficiently re-enforced. Spaced supporting webs are formed of crossed wire. Ties connect the webs and are secured to the wires at their crossing points, and the cementitious wall body covers the webs and fills the space between them. By this means the wall is not liable to break or crack.

Wm. B. Rohmer, Bay St. Louis, Miss. Three patents.—The first patent covers mail pouch catching and delivering mechanism, and is in the nature of an improvement on a former patent granted to Dr. Rohmer on August 12, 1902. One of the objects of this invention is to improve the mechanism employed alongside the track, said mechanism securely holding the pouch to be delivered to the car mechanism and receiving the pouch therefrom without danger of its falling. A further object is to provide means which will automatically lock the pouch so received and will carry it away from the zone of passing trains. Still another object is to provide means that will permit the detachment of pouches when placed on the wrong side of the mechanism, or caught by a train running in the wrong direction, thereby avoiding serious damage which would otherwise be almost certain to occur.

The other invention is a car fender comprising a downwardly moving catch member that is normally held elevated by a trip device, the latter being operated by the object to be picked up. Among the important features of the invention that may be mentioned are means whereby the fender can be readily applied to a car and detached therefrom, the structure being such that it can be easily placed out of the way if it becomes necessary to couple two cars. It is also normally held out of engagement with the track or roadway, and is released by contact of an object therewith so that it will drop and be locked in an operative position to catch and retain the object, thereby effectually preventing the same passing beneath it.

The third invention is a scrubber and a part interest therein is assigned to Robert J. Turner. An object of this invention is to provide a scrubber or cleaner having a plurality of mop cloths or scrubbing portions, adapted to be successively brought into use by turning the device, to enable a floor to be scrubbed more rapidly than is possible with a mop having only one scrubbing face or portion. Another object of the invention is to enable the parts or members carrying the mop cloths or scrubbing portions to be reversed for squeezing the mop cloths or scrubbing portions to expel the water from the scrubber or cleaner, and thereby obviate the necessity of employing a wringer for such purpose.

Jacob H. Ullrick, Nashville, Tenn. Drag Bar for Grain Drills.—An object of the present invention is te enable hoes, disks or other drilling devices to be readily adjusted to arrange them either in a perfectly straight line for clean ground, or in V form for throwing off the trash at the sides of the grain drill, without affecting the operation of the mechanism, which throws the drag bars into and out of operation, and sets them at the desired depth.

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FOR SALE—Patent No. 885,963, dated April 28, 1908. Potato Planter. Cuts, plants and covers seven acres per day. Knife and planter driven by pitman. Depth adjusted by tilting levers of ordinary mower. One man does the work of twenty. Address, John Sieffert, Winnepegosis P. O., Manitoba, Canada. oct

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FOR SALE—U. S. Patent No. 883,685, dated April 7, 1908. Automatic Track Gage and Leveling Machine. Shows low joints, elevation, narrow or wide gage. Has been tested and works finely. Address, Louis Barceloux, St. Guillaume Station, Quebec, Canada. oct

FOR SALE—Patent No. 886,533. dated May 5, 1908. Automatic Farm Gate. Opens and closes by same pull. On horse or in vehicle. Easy to work. State and county rights for sale. Address, W. B. Morgan, Frankston, Texas. oct

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FOR SALE—Patent No. 878,951, dated Feb. 11, 1908, Car Wheel. It prevents accidents. Inventors address, Murray Hendricks, Benwood, W. Va. sep

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FOR SALE—Patent No. 878,938; a centrifugal churn, issued February 11, 1908. Will sell for cash or reasonable terms if good papers are given. Address, Erick A. Collin, Turner, Holt County, Nebr. aug

FOR SALE—Outright U. S. Patent No. 878,443. Grain Chute for breaking into cars. Every dealer in grain cars can save time and money with it; fully tested. Reference given. Address, A. G. Young, 69 State St. New London, Conn.

FOR SALE—Patent No. 866,678, dated Sept. 24, 1907. Work holding means. Must sell at once on account of sickness. Will sell to highest bidder. Address, Olaf Pearson, 318 North Sarah Street, Escanaba, Mich. aug

FOR SALE or royalty—Application Serial No. 395,247, allowed March 5, 1908. Picture Hanger. Permits frame to hang at any distance from floor, at any slant desired; is adjustable, and safe on light and heavy frames. Address, Wm. Newgent, West Baden, Ind. aug

FOR SALE — For cash at reasonable rates Patent No. 877,956, dated February 4, 1908. Water elevator using pneumatic pressure. Used in wells, reservoirs or other sources of water supply. Address, M. R. Shrouds, North Powder, Oregon. aug

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FOR SALE—Patent No. 878,047, Hasp Lock. Will sell outright or lease on royalty. Terms to suit purchaser. Address, George F. Darracott, Aberdeen, Miss. aug

FOR SALE—Patent No. 878,428. Cattle Stanchion. A handy convenient labor-saving device. Can be attached to any cattle stanchion and used every day, and also in case of fire. Address, H. Siedschlag, R. No. 2, Box 18, Monroe, Wis. aug

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WANTED.

WANTED—Figures as to cost of constructing Patent No. 824,061. Address, Mrs. L. Borden, 359 E. 5th Ave., Spokane, Wash. aug

WANTED—An individual or corporation to undertake the manufacture of Automobile Sled Attachments, Patent No. 888,933. Investigate if interested. Address, H. H. Rohlf, New London, Wisc. oct

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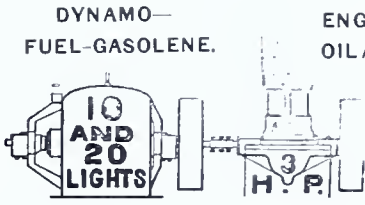
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American vs. European Ingenuity.

Although Americans are the most ingenious and mechanically up-to-date of all the peoples of the earth, and like the Athenians of old, are always interested in a new thing, we have yet some lessons to learn from older civilizations. It cannot be doubted that our record in making useful inventions is marvelous. Without an effort one can recall the lightning rod, the cotton gin, the steamboat, the sewing machine, the telegraph and telephone, the arc and the incandescent electric light, the linotype, the phonograph, the whole series of reaping machines down to the latest combination harvester, and dozens of others that are now reckoned as among the indispensables of everyday life. The list is so brilliant that we may be excused for forgetting the things that we have not ourselves invented, but have borrowed from Europe—the balloon, the power loom, the steam engine, the life preserver, the daguerreotype—first fruit of modern photography — the spectroscope, the X-ray, the bicycle, the turbine, wireless telegraphy, etc. There is enough for which we are indebted to foreign lands to make us feel that we have rivals in the struggle for leadership in invention.

There are many little contrivances, too, which we could profitably import. It must be confessed that in some ways the comfort and convenience of the public are more considered by the authorities abroad than in our own busy country. The freedom of the cities on the Continent from the smoke nuisance; the methods of destroying garbage and refuse so as to create gas, afterwards employed for power purposes; the utilization of sewage for fertilizer, instead of letting it poison the streams—these are a few of the more important cases in point. To instance lesser improvements, there is the noiseless milk cart—a thing like a hose truck, with cans swinging silently from hooks along the sides; and the postbox that dumps like a cart, the mail collector needing only to hang his pouch on hooks on the bottom of the box and turn a crank. The letters fall at once into the bag, the whole taking less time than an American carrier needs to gather in his first handful. There is the way of cleaning out switches on railways: a man equipped with a pointed steel implement, something like a plow, walks the track, pushing his little cleaner before him; the dust gathers in a pan behind the plow, is dumped at intervals, and is gathered by another man who follows with a cart. There is the method of sending telegrams—in many cities of Europe you simply drop them into a box on the side of the first street car that comes along, there being a telegraph office at every trolley station. This is a much better system than to have to call a messenger or to walk a number of blocks before you find an office. European street cars are in many ways more convenient than our own. They are never crowded: when they are full, no other passengers are permitted to push their way in. They are frequently provided with clocks, so that travelers rushing to catch a train or to meet an appointment can learn how much time they have before them. There are also devices for announcing the next stop, and even—in certain cities—for holding cigars.

When, however, the relatively brief period of our existence as a nation is remembered, and what we have accomplished in this century and a third of endeavor, we can justly take credit to ourselves. In the domain of mechanical devices—although we cannot claim a monopoly, and should be glad to accept any foreign improvements—we are undoubtedly in the forefront. The attention of our people was turned in this direction from the early days of our history. The stress of economic need promoted a natural cleverness, and some conspicuous successes inspired the national imagination. The Patent Office has become a center of American pride. and to take out a patent is an almost universal ambition. The fact that the number of patents issued annually in the United States about equals that in all the rest of the civilized world is a fact whose significance needs no comment.

Baths in Radium.

The growing importance of radium as a therapeutic agent has come to be recognized, and a special laboratory has been constructed in Bohemia for the industrial production of radium compounds. The uranium ore of St. Joachimsthal contain higher percentages of this mysterous element than any other known deposits thus far investigated. Enormous amounts of rock are required for the production of a tiny fragment of radium salt. An extensive sanitarium is being erected in the same place, where patients can take baths in the water pumped from the mines. This water seems to be sufficiently charged with radium compounds in solution to exert a distinct therapeutic action, and physicians are prescribing its use.

To Solve the Smoke Problem.

An investigation recently made of means for lessening the smoke evil in our cities has resulted in the issuance of a Government bulletin, which contains many interesting facts and conclusions. The experiments were made by the U. S. Geological Survey, and the original purpose was to increase the efficiency of fuels and thus prevent their waste, especially those used by the government.

All large cities are interested in efforts to reduce the smoke nuisance. Its injurious effect upon the health of the community, and the drawbacks it offers to maintaining a proper standard of cleanliness make it one of the most vital of municipal problems. Pittsburg has long been a notorious sufferer, but other cities, especially in the west, have almost as great cause to complain. No spot where manufactories exist and where a quantity of bituminous coal is burned, is free from smoke. The centers of industry in the east have used anthracite as far as possible, and thus have avoided the difficulty; but the central and western states are dependent upon softer fuel, and it is not surprising that the greatest improvements in the methods of burning bituminous coal have been made in those sections.

The various appliances for heating houses—furnaces, ranges, etc.—are as a rule constructed with a view to the use of anthracite. Whenever bituminous coal is burned in such furnaces, all the principles of combustion are violated and smoke results. The supply of anthracite coal is limited, and even the cities of the east, nearest the source of supply, are now finding it necessary to supplement this fuel with a considerable tonnage of bituminous. It is clear that, in future, our country must depend mainly upon the latter fuel for manufacturing, railroad and power plant purposes. In view of this outlook, it is reassuring to be told that smoke, and its consequent pollution of the atmosphere, can be readily avoided. The expert engineer who is the author of the bulletin declares that coal can be burned without smoke as well as gas, gasoline or oil, if the furnaces are properly designed and adjusted. Many steam power plants in the United States, he adds, are now burning bituminous coal with practically no smoke, and the inference is drawn that if this is true of certain plants it can be made true of all.

The more nearly perfect the combustion of fuel, the less smoke is generated and the greater efficiency attained. The bulletin proceeds to point out the conditions under which boiler plants burning a high volatile coal can be rendered virtually smokeless, giving off no black or dense gray masses to poison the air except when a fresh fire is being built. In view of the general importance of this subject, we quote below an epitome of the requirements:

"The coal should be supplied to the furnace in small quantities at frequent intervals; the more nearly the feed approaches a continuous and uniform supply, the better.

"The air supply should be slightly in excess of the theoretical amount required, and be admitted principally through the fuel bed, with an auxiliary supply admitted at the front or rear of the furnace to burn gases from the coal.

"The temperature in the furnace should be sufficiently high to ignite the gases given off from the fuel bed.

"There should be a fire-brick combustion chamber of sufficient dimensions, and so designed as to cause the thorough mixture of the gases and the air, permitting complete combustion before the mixture reaches the boiler surfaces."

The engineer has found that, contrary to general opinion, the higher the temperature the more smoke is produced. The most important element is the skilled fireman, which means intelligent supervision of the draft and care in firing.

Saving the Lives of Miners.

Peace, we are poetically assured, hath her victories no less renowned than war. It is something of a jolt to our national self-satisfaction to learn that it is at a greater cost to humanity. The loss of life, in these piping times, is greater than it would be in widespread and perpetual conflict. We shudder at the carnage of battle, but we give little heed to the slaughter dealt by our industrial Juggernaut. Every year the Pennsylvania coal fields alone furnish a list of deaths equal to those of Bull Run. The railroads, too, garner a vast harvest of victims. To quote a prominent railroad man, "When soldiering becomes as deadly as switching, international disarmament will be at hand."

Efforts to stop this appalling sacrifice of human blood are being made. The museum of safety device in New York has several times been referred to in these columns, and its work commended as a step in the right direction. It is gratifying to record, also, that the Geological Survey is making experiments with a view to lessening the perils of mining. A division of this bureau has for some time been trying to decrease the waste of fuel in mining operations. The waste of life—the human screen heap—is now to receive attention. It is estimated that two thousand men lay down their lives every year, and four thousand more suffer injury, in order that our homes may be heated and the wheels of our industries kept turning.

Officials who have investigated the matter have come to the conclusion that the increase both in the number and in the gravity of mine explosions in America during the last seven or eight years, is to be attributed mainly to the absence of trustworthy information in regard to explosives, and the conditions under which they can be safely employed in the presence of the gas and dust that are found in mines. It is declared that half of the fatal mine accidents in this country, and one-third of the non-fatal accidents, are the result of falls of roof and slate, which are in turn traceable to the

great disturbing and jarring effect exerted by the discharge of large quantities of explosives within the mines. The experience of leading European nations shows that much of this danger can be averted. Many foreign governments have prohibited by law the use of excessive charges of explosives, and even set definite limits as to the amount that may be used. In England there are certain "permissible explosive" which must be employed by miners in blasting coal, and no others. Thanks to such government regulations, the casualties are relatively few, not only in England but on the Continent. The mines in Belgium are notorious for the presence of fire damp; yet that country enjoys apparent immunity from these terrible explosions.

It is to be hoped that these national experiments, which not only cover the explosive qualities of various powders and dynamites when subjected to coal gas and fire damp, but include methods of rescuing victims of accidents, will result in the passage of a national law regulating the use of bigh explosives. If the mine owners, the miners and the government will cooperate in the effort to prevent explosions—as is the practice in Europe—we may hope to see the death roll of our mining industry reduced to a minimum.

A Pneumatic Typewriter.

A machine that is operated by pneumatic power, so tbat it takes very little to operate it, and that is practically noiseless in its working, is described in a recent issue of the *Literary Digest*. The keyboard looks very much like that of an ordinary machine, but the keys are connected with the type-wheel by means of a small tube, and the characters in raised type on the rim of the wheel are thrust out so as to strike the paper on the cylinder. A very light touch opens the pneumatic valve, and the type is imprinted upon the paper, forcibly enough to make an impression, and yet without noise. The clearness of the print is regulated by modifying the size of the air-tubes, which is done with a special lever. The slight contact of the finger suffices to produce a large number of carbon copies, the pneumatic power always actuating the types with equal force. Several letters may be printed at once by pressing the corresponding keys simultaneously. The machine may be combined with an automatic multiplier, producing a perforated pattern in a strip of paper below the keyboard. The ordinary typographic impression is made at the same time. When the writing is completed, the perforated record is introduced into the machine and reproduces the text automatically as often as desired. By this process numerous carbon copies may be made, which ensures important economy of time.

A Noiseless Gun.

In the wake of smokeless powder comes the noiseless gun, which will most effectually conceal the enemy in time of warfare. Hiram Percy Maxim, the son of the inventor of the Maxim gun, has devised a weapon that can be fired again and again without the slightest noise to indicate wbence the missile is discharged. Maxim makes use of a piston valve which slides across tbe bore of the barrel immediately after the bullet passes the valve, being actuated by the pressure of the gases tbemselves, and not employing any intricate machinery. The valve prevents the gases from escaping suddenly with a loud report, and permits them to issue gradually through small holes, thus obviating all noise except a slight hissing sound. The valve then resumes an open position and a safety device prevents tbe firing of another cartridge until it is in its proper place. Ammunition of various kinds may be used—leaden bullets or steel projectiles—without affecting the working of the device.

Glass Threads.

The world has for many years been familiar with the spinning of glass, and the fine fibers bave been woven into wool, so-called, as well as into various objects. New uses are being found for these glass threads, which are now drawn out into such filaments tbat one of them, 140 feet in length, weighs only a third of an ounce. It looks like silk wadding, is snow-white, and is such a poor conductor of heat that it feels hot as soon as you touch it. For this reason, it is used for insulating electrical conductors, being much superior for this purpose to India rubber or silk. It could also be employed for insulating cables, but the threads are difficult to twist, and they are also too expensive to admit of general use. They are employed for imitating ostrich feathers with striking success, and are said to relieve rheumatism and gout, when wrapped about the afflicted member.

Diamond Cutting.

When the famous Cullinan diamond given to the king of England by the Transvaal government is sent to Antwerp to be cut, the tools used upon it will be of American invention. The process of diamond cutting has been much facilited by a device recently invented in the United States, which consists primarily of a circular saw. When diamonds first come into the hands of the cutters, tbe rough stone is placed in a metal receptacle with the side to be cleft downward. A mold is placed over it, into the top of which liquid aluminum is poured. This takes the shape of the mold, and on cooling secures the stone in position, the mold being tben removed. The circular saw is about four inches in diameter and is made of soft copper, the edge being prepared with diamond dust and oil. The rough stone is then set with a slight pressure against the saw, and is left in that position frequently as long as two weeks, according to the degree of resistance of tbe crystal.

Rough cutting is a process which might be termed that of "diamond cut diamond." Two stones of similar hardness are fitted into metal caps with cement. One of these caps is fastened to a rotary machine, and the other into a long handle. The cutter places this against the revolving stone, which is the first one to become smooth. For final polishing, the stone is clamped into position and pressed against a revolving disk of soft steel, rotating horizontally at the rate of 3,000 revolutions per minute. The disk is covered with a film of diamond dust and olive oil. After this process, the diamond is marketable. All the operations demand long experience and technical skill on the part of the worker. The diamond trade, says our consul at Antwerp, is the most exclusive in the world, and tbe secrecy of the art of working diamonds is maintained so completely that the industry cannot be introduced elsewhere, except through emigrating cutters.

Making Artificial Flowers.

Nature is rivalled in tbe modern factories of artificial flowers. This industry has been almost a national one in France, and our artificial flowers have been largely imported from Paris. But within tbe last decade the enormous consumption in this country induced tbe establishment of workshops here, and these have been successful.

Tbe showroom of a flower factory is like an exhibition of rare cut flowers. Roses of all sorts, orchids, forget-me-nots, jasmines' blossom on all sides; the silky softness of texture, tbe delicate tints, the tender veins and pale green stems being faithful to nature. Blow gently upon them, and tbe leaves fall back with the tremulous resistance of the real flower. Many of the blossoms used in the windows of the leading florists are made in factories, and so perfect are they in color and general appearance that they cannot be detected from the genuine; and they are much more durable for show purposes.

Most flowers are made of muslin, cambric and batiste, kid and paper being sometimes employed. The muslin is starched to the proper consistency and stretched on wooden frames to dry. Tbe petals and leaves are cut, two dozen at a time, on a lead block wtth a sharp die. The petals are tben passed through a dyeing process, and shaped into the delicate curves, required by an iron press. Tbe makers finish the shaping by means of hot pincers. The last touch is to perfume the most expensive of these products with the quintessence of the natural flower.

Welding Tubes.

A new process of welding tubes consists of blowing cold air, or air and gas, upon the edges of the steel or iron strip which is to be welded. In practice the air blast alone is used, because it is regarded as better, but a combination of air and gas can also be employed. The effect of the air blast upon the iron or steel bar, which is drawn through the furnace at what is regarded as welding heat, is similar to that of blowers on coal or wood—it being more than double the temperature of the edges.

The device consists of cast-iron arms placed on each side of the furnace. Each arm has a slot hole 18 inches in length and three-sixteenths of an inch in width, and by means of a rest the strip is held right in front of tbe slots. Through the slot holes, cold air is blown by the use of ordinary rotatory blowers on each edge of the strip. The air blast, while heating the edge of the strip to a greater temperature, through the mixture of the oxygen in the air with the impurities in the steel and iron, leaves a perfect edge. In butt welding the tube is drawn through the usual bell, its edges being squeezed togetber and an even butt-welded joint results. The process can also be applied to the well known method of manufacturing butt-welded iron and steel tubes by squeezing the edges of the beated strip or skelp together with tongs as it is drawn from the furnace.

In lap welding, the air is driven so as to impinge upon the scarfed edges of the strip as it leaves the furnace, and just before it passes through the welding rolls, so tbat the scarfed edges are raised to the proper welding heat, and a perfect and proper lap weld is formed.

It is claimed that this invention obviates tbe loss that occurs when the strip buckles, or is burned by the excessive heat. An improper weld is formed, or the tubes become distorted in the process of drawing and welding. This is because, while tbe whole strip is necessarily of a very bigh temperature wben drawn from tbe furnace, its edges only are superheated by the air blast.

Elevator for Canals.

Instead of employing the old-time lock, the latest method is to lift boats in canals from one level to another. The apparatus wbich is designed for this purpose has the advantage of minimizing the loss of water which is inseparable from the ordinary system of lockage, and also provides for tbe passage of vessels simultaneously in both directions at a single operation, between levels of widely different altitude, thus greatly reducing the loss of time involved in the passage of a boat through a flght of locks. Generally speaking, the apparatus consists of a system of wet docks, wherein vessels to be transferred are water borne. The docks are mounted on wheeled carriages adapted to support tbem horizontally and to run on inclined railways extending between the higher and lower water levels, such railways being to transverse to the length of the docks which travel broadside on, so as to admit of a short length of wheel base, and a steep grade. The docks are provided with end gates, wbich open and close for the ingress and egress of vessels by rising and falling in a vertical plane, suitable grooves being provided for the gates to work in, and means for making a water-tight closure. The end of each dock, when in position at the top of its inclined railway, makes a practically water-tight joint with the standing work of the extremity of what may be termed the upper pond. The dock then forms a continuation of the upper canal, there being also a similar gate provided at the end of each of the upper bays, to retain tbe water in the upper level of tbe canal when the docks are absent.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies $1.50.—Please give correct data in ordering.—Address,

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Rug-making machine....J. E. Garrett
Safety-pin attachment....I. Nielsen
Sandpapering-machine....E. A. Soules
Sap-receiving receptacle....E. A. McKoy (Reissue.)
Sash-lock....W. Zander
Saw set and gage, Combined...A. Champeau
Scraper, Boot and shoe..G. and M. J. Roesken
Screening apparatus....E. H. Nutter
Sectional box....O. G. Collier
Sewage-disposal apparatus....W. C. Matthias
Sewing-machine....R. G. Woodward
Sewing-machine cabinet....J. O. Pettey
Sewing-machines, Shuttle-actuating mechanism for lock stitch....L. F. Fales
Shade-bracket fastener....C. Joseph
Shade-roller bracket....J. T. Hampton et al
Shaft, Flexible....G. H. Coates
Sharpener, Knife and scissors....M. L. Hawks
Shears, Pivot-screw for...C. W. Rausch et al
Sheet-metal handle....P. D. Skahen
Shelf-bracket....J. P. McKinney
Shirt....J. V. Wilson
Shirt-waist protector....N. Roller
Shocks into wagons, Machine for loading....G. Marshall
Shoe attachment....C. Wilcox
Shoe-holder....C. A. Fisher
Shoe-polishing device....J. M. Genack
Signal-controlling device, Electromagnetic....H. M. Crane
Signal-recorder....W. O. Rees
Skate....J. C. Miller
Slack-adjuster....J. M. Hines et al
Sleighs, Bolster-stake for....W. F. Roettger
Slicing mechanism....R. H. Little
Slop jar or pail....C. J. Kirch
Smelting furnace, Ore-....J. T. Jones
Snap-bench, Portable....W. G. Stockham
Soap-holder....L. E. Travis
Soap powder, Production of....W. Lüring
Spark-arrester....R. A. Bender et al
Speed indicator and recorder....A. Shedlock
Speed mechanism, Variable-, 2 pats....N. D. Chard et al
Speed mechanism, Variable-..A. J. Doebbeling
Speed-regulating device....A. P. Schmucker
Spoke, Vehicle-wheel....J. C. Wise
Spring-clip....F. B. Sanders
Spring-wheel....B. F. Diffenbaugh
Sprinkler-head stop....C. L. Grode
Squaring gage, Subject-....V. Royle
Stamp-affixer....Z. T. Brown
Stamp, Hand-....T. J. Robison
Starch and making the same, Perfumed....W. J. Marshall
Steam-generator....J. C. Parker
Steam or hot-water boiler....C. F. Bachler
Steam-separator....W. E. Stanley
Stoker, Mechanical....H. P. Tippett
Stone machine, Artificial-....J. A. Smalley
Stool, Milking-....P. Libak et al
Stovepipe length, Extension....H. J. Daniel
Strip-feeding machine....L. C. Wing
Stump and brush cutting machine...T. Rustad
Surface-finish, One-coat..G. Dosselman et al
Surfacing-machine....J. F. Stoll
Swing....F. P. Rathbone
Switch-operating mechanism..J. P. Blackwood
Talking-machine sound-box....T. Kraemer
Tap and faucet, Barrel..D. J. McGinley et al
Target....G. E. Houck
Target-trap....J. W. Haughawout
Telegraphic transmission instrument, Automatic....J. Gell
Telegraphone....H. R. Stuart
Thawing frozen ground, &c., Apparatus for....C. Schweizer
Therapeutic apparatus....T. Powell
Threshing-machine....T. Dugan
Ticket-holder....F. A. Morrison
Ticket issuing and recording machine....T. F. Ohmer
Time-alarm....G. Hogan
Tin from crude tin or tin alloys electrolytically, Obtaining pure....O. Steiner
Tipple, Steam-....F. R. Willson, Jr.
Tire casing, Automobile-....C. L. Higgins
Tire-protecting device....L. H. Kinnard
Tire-shrinker....W. D. Markham
Tires, Press for the molding of bicycle and other....W. H. Cox
Tobacco-box, Sheet-metal pocket....W. J. Chambers
Tobacco-package....J. W. Surbrug
Tongue-plate....E. M. Winslow
Tongue-switch....C. A. Alden
Tool, Combination-....W. S. Burris
Tool, Compound....W. L. Marble
Tool-operating mechanism, Machine-....S. H. Bullard
Top lift....B. F. Mayo
Traction-wheel....M. E. Perring
Transformer, Electrical....S. E. Johannesen
Transformer-regulator....W. H. Thompson
Trenches and rolling soil, Implement for forming....H. Erickson
Trolley....S. D. Hunt
Trolley-replacer....J. Trout
Trolley-wheel support....J. H. Gross
Truck, Bogie-....J. H. Keiderling
Truck, Hand-....H. R. Moff
Trucks, Column-guide for car-...C. F. Murray
Trunk....W. G. Winans
Truss....J. O. A. Remine
Turbine....W. O. Wright
Turpentine-scraper....G. S. Petteway et al
Type-cabinet, Revolving....C. F. Brainerd
Type-composing machine....J. M. Dove et al
Type-distributing machine..F. B. Converse, Jr.
Type-writer platens, Copying-cloth for....A. J. Farmer
Type-writing machine, 2 pats....S. Nielsen
Type-writing machine....J. Felbel
Type-writing machine....C. J. Bond
Type-writing machine....W. F. Helmond
Type-writing machine....C. E. Kelley
Type-writing machine....J. C. McLaughlin
Type-wriiting machine....R. J. Orr
Type-writing-machine attachment..F. P. Gorin
Unloading apparatus....W. Claypoole
Upholstery-machine....I. Karpen
Urinal....D. A. Ebinger
Valve....F. C. Blanchard et al
Valve....T. W. Lowe
Valve-action, Pneumatic....H. Bainton
Valve, Combination gas and water....H. S. Humphrey
Valve device for heating systems..J. H. Kinealy
Valve for stand-pipes, &c....E. V. Anderson
Vault, Sanitary....N. W. Hartman
Vehicle-lubricator....G. Barthold, Jr.
Vehicle, Motor-....J. and W. A. Phillips
Vehicle running-gear....I. E. Palmer
Vehicle steering device....E. J. Vraalstad
Vending-machine....A. E. Wyatt
Vending machine, Needle-....F. W. Green
Voting-machine....W. H. Strong
Wagon-box....H. J. Hopkins
Wagon, Dumping-....H. H. Walsh
Walls of building-blocks, Apparatus for laying....C. M. Maddox
Wardrobe, Collapsible....S. E. Blackstone
Warp-stop-motion mechanism....W. C. Perry
Warp-winding-machine guide...R. G. Campbell
Washboard and clothes-pounder, Combined....A. S. Wadsworth
Washing-machine....W. S. Hamilton et al
Washing-machine....J. Huebner
Washing-machine....E. Eisemann
Watch-bow....C. L. Depollier
Watch, Chatelaine brooch-....C. L. Depollier
Watch-holding device....F. Lindner
Water-heater....R. Farren
Water-heater....B. A. Kennepohl
Water-heater, Electrical instantaneous....L. C. Henriksen
Water-purifying apparatus....J. C. W. Greth
Water-purifying apparatus....H. Reisert
Weighing powdery substances, Means for automatically....A. F. H. Stephens
Well-drilling apparatus, Feed for..R. C. Jones
Well-drilling machine....H. L. Hoopengarner
Wheelbarrow....A. O. Hubbard
Whiffletree-hook....L. Morgan
Winch or the like for use with cords or ropes subject to tension....B. Percival
Wind-motor, Oscillating....D. D. McIntrye
Window-fastener....F. C. Johnson
Window-screen....W. J. Baker
Window-weight....G. W. Simmons
Wire-stretcher....W. F. Richards
Wires or wire ropes, Means for testing....C. E. S. McCann et al
Wood-graining-machine....C. W. Munz
Woodworking-machine....R. P. De Remer
Work-box, Lady's....A. Anderson
Wrench....F. E. Walden
Wrench....J. R. Long
Wrench....B. N. Lehman
Writing or drawing packet....B. S. Lobdell

DESIGNS.

Badge....W. E. Edwards
Badge....J. E. Johnson
Box....F. Schoettle
Bracelet....J. A. Cowie
Brooch-pin....F. W. Koonz
Jacket....W. H. Wye
Lamp, Street-....C. P. Massard
Rug....J. W. Hill
Scarf, Neck-....J. Mead
Spoon, fork, or similar article...C. A. Bennett
Spoon, fork, or similar article....J. Clulee
Spoon, fork, or similar article..W. H. Perkins

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MECHANICAL PATENTS.

Acetylene-generators, Carbid-feeder for....I. Peirce
Adding-machine....J. G. Cincent
Adding-machine, Electrically-operated....R. L. Burd
Adjustable indicator....J. H. Rand
Air-brake-control mechanism....H. Rowntree
Air-brake equipment for cars....H. Rowntree
Air-brake system....H. Rowntree
Album, Photograph-....E. W. Peterson
Amalgam-press....A. J. Leveque
Andiron....A. A. Low
Automobile....A. G. Davis
Automobile construction....G. Engel
Automobile running-board....H. E. Coffin
Automobile suspension-frame....R. Herman
Awl, Self-feeding sewing-....E. Blossfeld
Axle, Ball-bearing vehicle-....J. D. McIntosh
Bait, Artificial....C. D. Caldwell
Baking-pan....M. L. Leahy
Balancing-machine....J. Riddell
Ball-bearing wheel....W. Sparks
Bandage, Inflatable....P. Mitchell
Bandeau....R. J. Nichols
Barrel-filling machine....W. Ihnken
Barrel-shelf....A. O. McCoy
Battery....A. T. Vigneron
Bearing, Antifriction wheel-....W. J. Brewer
Bed-pan....M. Moore
Bed-seat, Convertible....T. F. Harris
Beehives, Foundation-fastener for honey-sections of....E. H. Dewey
Beets and the like roots, Machine for cutting off the tops of....O. N. Frankman
Belt-shifter....F. L. Lucke
Bench-dog....C. H. Krogh
Bicycle....R. Huber
Billiard-bridge....E. A. Nelson
Binder, Loose-leaf....F. H. Crump
Bit-brace attachment....J. A. Schmidt
Bit-extender....W. H. Ehrhart et al
Bobbin-frame....H. McDowell
Boiler stay-bolt....L. Borneman
Boiler tube or flue cutter....F. W. Putsch
Boilers, Means for protecting grate-bars in....O. Hoffman
Bolting-machine....J. W. Johnston et al
Book, Loose-leaf....F. von Schlegell
Boots or shoes, Machine for operating upon the toe portions of, 2 pats....O. Ashton
Boring-mill....S. S. Wheeler
Bottle....L. G. Sabbag
Bottle-closure, Self-adjusting...H. C. Harness
Bottle, Non-refillable....L. H. Cortright

Bottle, Non-refillable.....H. F. Erfman, Sr.
Bottle, Non-refillable.....M. Schwarz
Bottle-stopper.....G. Kirkegaard
Bottle-stopper.....E. H. Speece
Box-office, Collapsible portable..I. Fluegelman
Brake mechanism.....H. Rowntree
Brake-shoe, Railway-car.....S. A. Corne
Brake-shoe, Vehicle.....T. L. Knapp
Bridge construction.....W. S. Hewett
Bridge, Lifting.....M. Waddell
Bridle-bit.....H. M. Mason
Bucket, Dumping-.....D. S. Barrows
Buckle.....W. J. Boyd
Building material.....J. C. Fitzsimmons et al
Burner-nipple pricker and cleanser...S. Spiller
Button, Cuff-.....J. Pejchar
Cabinet, Waiter's.....B. H. Farrell
Calculating and recording machine.....
.....F. S. Baldwin
Calendar and automatic date-indicator, Combined perpetual.....A. G. Raymond
Camphene, Making.....O. C. Billeter
Can attachment, Oil-.....H. W. Bowman et al
Can capping and compressing machine, 2 pats.
.....H. L. Guenther
Can-making machine.....C. W. Graham
Canopy.....H. C. Morse
Car and locomotive wheels, Clutch mechanism for railway-.....J. D. Donovan
Car-fender and attachment.....E. Gerwig
Car-handling apparatus.....W. J. Patterson
Car-handling apparatus, Drier-...J. Wyszynski
Car-step, Movable.....J. Geppner
Cars, Pressed-steel journal-box for railway-...
.....W. H. Shinn
Carbureter.....A. W. Menns
Carbureting apparatus for explosive-engines...
.....F. Dürr
Carnation-supporter.....W. Greer
Carriage-curtain.....R. Wall
Carrier.....W. and J. F. Mitchell
Caster for tubular legs.....A. B. Diss
Caster, Furniture-.....A. B. Diss
Cattle-guard.....E. J. York
Cellulose derivative.....E. Knoevenagel et al
Chain, Drive-.....C. G. A. Schmidt, Jr.
Chain wrench.....F. W. Trabold
Chair and table, Combined.....J. S. Bryan
Chair-iron.....H. W. Bolens
Check-fastening device.....R. J. Cox
Chimney-cap, Adjustable.....J. E. Giffin
Chuck.....F. Müller
Chuck.....X. St. Pierre
Cigarette-case.....H. C. Pedersen
Cigarettes, Machine for applying cork tips to..
.....J. N. Tzibides
Circuit-breaker.....A. Smith
Circuit-controlling device.....G. H. Dorgeloh
Clamp.....H. Wichers
Classifier.....J. R. Holmes
Classifier or separator.....C. Churchill
Clavicular apparatus.....R. H. Cheatham
Cleaning apparatus, Nozzle for pneumatic.....
.....A. W. Kindel
Cleat.....C. F. Foote
Clipping-machine.....W. B. Hoerr
Clock, Alarm-.....W. J. Larkin
Clock, Alarm-.....W. E. Porter
Clock-case.....W. M. Barry
Clutch, Friction-.....E. D. Mackintosh
Clutch, Friction-.....H. R. Stacks
Coal and ore washer or concentrator.....
.....W. L. Scaife
Coal-grinding apparatus.....T. A. Edison
Collar retainer, Coat-.....J. G. Pease
Collar-support.....M. J. Topp
Collars, Making horse-.....L. J. Powers
Colors, Making phosphorescent.....
.....W. J. Hammer. (Reissue.)
Computing-machine.....H. J. Burtis
Concrete-mixing apparatus....P. C. Hains, Sr.
Concrete piles, Apparatus for sinking.....
.....F. B. Gilbreth
Concrete reinforcement.....J. J. Whitacre
Conduit-box.....W. S. Rounds et al
Conveyer.....W. L. McCabe
Conveying apparatus.....J. Ream
Cooling apparatus.....G. T. Voorhees
Copper from copper-bearing solutions, Recovering.....L. Amenábar
Copper from its ores, Recovering.....
.....H. M. Wilcox. (Reissue.)
Corn-gathering machine.....W. Hibbs
Cotton-picker.....C. B. Shinn et al
Counter.....F. C. Howe
Crate, Banana-.....M. Lombardo
Cross-tie, Metallic.....G. S. and R. P. Bickley
Crossing-protector for high-tension lines.....
.....J. F. Dostal
Cuff-fastener.....G. M. Gluchowski
Culinary apparatus, 2 pats.....
.....W. S. Hadaway, Jr.
Cultivator.....M. R. Cole
Cultivator for destroying cotton-boll weevils..
.....W. E. Hinds
Current-motor.....R. L. Martin
Current motor, Alternating-.....M. Déri
Curtain rod, Window-.....L. Rèder
Curtain-stretcher.....J. Stawartz et al
Cuspidor attachment.....M. G. Miller
Cutlery-glazing machine.....J. G. Blessing
Cycle attachment, Motor-.....T. W. Razoux
Dashboard, Vehicle extension-..J. E. Albright
Deck-plate.....A. R. Hurlburt
Derrick.....F. Hunt
Desk and seat, School.....J. E. Ament
Desk attachment.....H. Schenk
Directory, Telephone-.....W. R. Hunter
Display apparatus, 2 pats.....H. L. Beach
Display-rack.....P. Jr., and H. Roush
Display-stand.....F. W. and G. W. Woelz
Displaying device, Salesman's sample-.....
.....B. Wolfson
Distribution system.....A. H. Armstrong
Ditching-machine.....G. A. Omwake
Dividers.....A. J. Hibbett
Door fastener, Sliding-.....G. L. McCallum
Door fastener, Sliding-.....Z. T. Beatty
Door, Grain-.....F. T. Slayton
Door hanger, Sliding-.....R. E. Washburn
Door-stop.....H. Pawsat
Draft-equalizer.....H. L. and E. C. Litchfield
Drains, Animal-stop for.....A. J. Shepard
Dredge.....G. W. King
Dredge.....C. C. Jacobs
Dredging apparatus.....R. E. S. Geare
Drill-drift, Automatic.....I. A. Weaver
Drinking-fountain.....J. R. Selzer
Driving-head.....F. P. Freeman
Driving mechanism.....G. W. Euker
Driving mechanism.....H. R. Wellman
Drum.....A. D. Converse
Dry closet.....G. W. Albright
Dry-kiln.....A. J. Uphus
Drying-room.....L. Verna
Duplicating apparatus, Stencil-.....A. B. Dick
Dynamo speed-regulator.....O. H. Erickson
Egg-beater.....J. B. Erwin
Egg-beating machine.....W. R. Chittenden
Elastic means.....L. A. Garchey
Electric coil and producing same.....I. Kitsee
Electric currents, Damper for the upper harmonics of alternating.....M. Leblanc
Electric currents, Switching...S. W. Mauger
Electric machines, Regulation of dynamo-....
.....C. P. Steinmetz
Electric meter and service box...C. G. Durfee
Electrical contact terminal.....C. W. Clifford
Electromagnetic effects, Telephonic protector against.....C. Duó
Elevator.....C. D. Seeberger
Elevator.....F. H. and F. H. Brown
Elevator safety device.....G. B. Rice
Engine.....J. Weisenborn
Engine reversing device, Explosive-.....
.....C. M. Stroud
Engine safety device, Internal-combustion-....
.....J. D. Macpherson
Engines, Fuel-pump for internal-combustion..
.....J. D. Macpherson
Engines, Process and apparatus for injection of liquid fuels into internal-combustion.....
.....R. Diesel
Envelop.....J. A. Travers
Envelop, Clasp-.....M. S. Shapleigh
Envelop-machine.....E. P. Waterhouse
Excavating and loading device..E. F. Baldwin
Excavator, Trench-.....G. W. Parsons
Expansion-engine.....E. Belknap
Explosion-engine.....H. Junkers
Explosive shell.....M. W. Gilmartin
Eye-guard.....H. M. Tileston
Eye-guard, 2 pats.....H. S. Cover. (Reissue.)
Eye-shade.....E. B. Thomson
Eyeglasses.....G. J. Lowres
Face-protector.....F. K. Wilcox
Fastener.....M. D. Willard
Fastener.....A. G. Hoegren
Faucet.....A. N. Rose
Faucet and overflow, Combined....T. J. Dyer
File-case.....G. J. Stevens
Filing-cases, Portable platform for....A. Jones
Filter.....E. M. Knight
Filter.....P. J. Donovan
Filter or screening-machine.....M. Lamort
Fire-escape, Portable.....E. G. Gaillac
Fisherman's fly and bait book.....H. J. Frost
Fishing device, Automatic..J. H. Darnell et al
Fishing-reel.....L. F. Douglass
Fishing-tackle holder.....M. M. Schaney
Floor-scraper.....P. Dosch
Fluid-motor.....D. Craig
Foldable table.....M. Ullman
Folding box or crate.....J. A. Lamp
Folding chair.....V. Pilia et al
Force-feed lubricator.....G. D. Banta
Foundry-molds and the like, Machine for manipulating.....P. Bonvillain. (Reissue.)
Freight mechanism, Automatic.....
.....G. W. Younkman
Fruit and like packing press.....A. D. Blank
Furniture, Combination.....N. J. Coté
Game apparatus, Base-ball-.....W. O. Dapping
Game-board.....R. Forrest
Game device.....E. Shinn
Garment.....J. C. W. Rahn
Garment-fastener, Separable.. ....I. S. Cliff
Garment-holder.....C. Lamping
Garment-pattern, Adjustable.....J. U. Dufault
Garment-shaper.....L. N. Bishop
Gas apparatus.....A. M. Sutherland
Gas-meters and the like, Coin-controlled apparatus for prepayment.....B. G. Waggner
Gas-producer.....G. Westinghouse
Gas-purifier.....O. W. Peterson
Gas scrubber and washer.....J. Sherman
Gas-washer.....B. J. Mullen
Gases containing sulfur dioxid, Apparatus for treating.....J. L. Tufts
Gate.....T. Powell
Gear, Bevel-.....C. J. Reed
Gearing, Pawl-and-ratchet.....J. R. Johnson
Gem-holder, Automatic adjustable.....
.....P. H. Goodwin
Glass box or case.....F. L. O. Wadsworth
Glass, Drawing.....R. S. Pease
Glass grinding and polishing apparatus.....
.....F. L. O. Wadsworth
Glass plates in show-cases and store-fronts, Means for fastening...R. F. Robinson et al
Glass polishing and grinding apparatus.....
.....F. L. O. Wadsworth
Golf-club.....H. Beale
Governor.....A. C. Allan
Governor, Engine-.....A. Heathcock et al
Grader.....H. Tompkins
Grader, Road-.....W. S. Livengood
Grading machine, Road-.....R. C. Redpath
Grain-bleaching apparatus..W. L. Harvey et al
Grain drying, scouring, and cleaning machine
.....H. P. Crockett
Graphaphone sound-boxes, Regulating device for .....S. Berens
Gravity-carrier.....R. P. Mathews et al
Grinding and glazing machines, Knife-holder for.....J. F. Lamb
Gum-wrapping machine.....H. Y. Armstrong
Gun.....O. H. Peak
Gun-sight.....D. B. Harris
Gun-sight.....F. Hendrickson
Gun, Air-..... ....A. H. M. Driver et al
Gun-wad.....W. L. Myers
Haircloth fabric.....G. S. Cox
Halter or head-stall for breachy stock, &c.....
.....J. M. Atterbury
Harness attachment.....O. Evertz
Harrow tongue-support, Disk-.....
.....L. A. Buckley et al
Harvester, Beet-.....C. M. McCormick
Hasp-fastener.....A. W. Robinson
Hat-fastener, Lady's.....I. B. Malmstead
Hay-rake.....J. H. Cope
Heating device, Electric, 2 pats.....
.....W. S. Hadaway, Jr.
Heel-nailing machine.....C. C. Small
Hide-working machine.....J. W. Aulson
High-potential systems, Protective device for..
.....R. Apt
Hip-strap line-holder.....B. F. Harsh
Hoe.....W. F. Marsh
Holder and producing the same, Ornamental..
.....H. Hawley
Hook or garment-fastener.....E. M. Borhek
Horseshoe-calk.....S. H. Roberts
Horseshoe toe-calk.....V. Winquist et al
Hose, Means for supporting flexible.....
.....H. J. M. Howard
Hose-rack.....H. J. M. Howard
Hydromotor.....A. Graf
Ice-creeper.....J. E. Ulsh
Ignition systems, Coil-box switch for.....
.....R. Varley
Insecticide.....L. F. Fride
Insulator-pin.....C. J. Dorff
Internal-combustion engine, Two-cycle.....
.....H. S. Hart
Jig.....G. C. Stone
Journal-bearing liner.....M. Wagner
Key-bolt.....E. Reed
Knife polishing or sharpening machine.....
.....H. B. Keiper
Knitting-machine attachment, Warp-.....
.....E. H. Heath
Knitting machines, Pattern device for warp-..
.....E. H. Heath
Lace fastener, Shoe-.....O. Howard
Ladle.....M. H. Treadwell
Lamp, Arc-.....R. Fleming
Lamps, Manufacturing the filaments of electric incandescent.....W. von Bolton
Lantern, Automatic magic.....H. Ingram
Latch, Gate-.....A. S. Kent
Lathe head, Handle-.....O. W. Stith
Lenses, Making bifocal.....H. J. Stead
Letter-box.....A. M. Rapoport
Lever-locking means.....H. E. Coffin
Lightning-arrester.....E. B. Merriam
Link connection.....A. C. Dowse
Linoleum, Device for filling apparatus for making patterns in.....P. Blaubach
Liquid-gage.....G. E. Whitney
Liquid heating, cooling, and pasteurizing apparatus.....J. F. Moul
Loading apparatus.....J. McCabe
Locks and latches, Striking device for door...
.....J. M. Cuff
Loom for weaving tubular fabric.....
.....C. H. Draper
Loom for weaving tufted fabrics....T. Cooper
Loom, Haircloth-.....G. S. Cox
Loom, Kindergarten-.....J. C. Tyndall
Loom thread-cutting temple....E. S. Stimpson
Looms, Bobbin-stripper for weft-replenishing..
.....F. W. Moore
Looms, Filling-exhaustion-indicating mechanism for.....F. Allen
Lubricating device.....C. J. Van Doren
Lubricator.....F. M. Davis
Lubricator.....E. McCoy
Lubricator.....H. C. Woodbridge
Lubricator drain-passages, Automatic oil-check for.....W. E. Bryant
Magnet, Rotary field-.....J. Hissink
Mail and express package handling device....
.....G. W. Roberts
Mail-bag deliverer.....L. B. Cox
Mail-bag-delivery apparatus...W. C. Getschow
Mail-box.....C. K. Hann
Mail catching and delivering device.....
.....F. W. Renner
Mail-marking machine....T. G. Stoddard et al
Manometer.....O. C. Smith et al
Manometer, Recording-.....F. N. Connet
Manure-spreader.....J. Boda
Measuring machine, Cloth-.....A. C. Jackson
Mercury-vapor apparatus, Starting.....
.....M. O. Troy
Metabolizer.....J. von der Kammer
Metal brake.....W. A. and T. H. Tarrant
Metal-polish.....E. V. Voris et al
Metallic tie and rail-fastener.....M. L. Sager
Micrometer, Interior.....A. L. Anderson
Millstone.....J. L. Durham
Mold-making machine.....H. M. Molder
Molds, Making.....F. M. Lawrence
Molding-machine.....J. W. Crosby
Motor control.....F. Eichberg
Motor-control system.....E. F. Dutton
Motor-starting panel.....A. Smith
Motors, Operating induction-....R. H. Parker
Mower, Lawn-.....E. W. McGuire
Muffler or protector.....J. E. Harrison
Music-leaf turner.....G. W. Hendricks
Music-leaf turner.....I. T. German
Music-leaf turner.....F. J. Lindeman
Music-leaf turner.....J. P. Sesseman
Musical instrument, Revolving.....
.....F. L. Brzinsky et al
Musical instruments, Pneumatic for keyboard..
.....R. H. McHardy
Nail-clipper and cigar-cutter....J. C. Pettibone
Necktie-fastener.....W. T. Robinson
Nest, Trap-.....W. S. Hill
Nose-bag.....A. H. Shoemaker et al
Nursing-nipples, Device for turning.....
.....E. L. Stuart et al
Nut-lock.....P. Clay
Nut-locking device.....I. Murphy
Oil-tank.....R. K. Brundage
Oil, Treating.....J. A. Dubbs
Oiling device.....C. D. McClintock
Ordnance, Protecting-shield for light.....
.....F. Charron
Oven-shelf.....W. L. Hogg
Package, Sealed wooden.....H. U. Ruedy
Packaging-machine.....F. Giroud
Packing for rock-drills, Rod-.....W. L. Smith
Packing for steam-engines, Piston-.....
.....J. J. McGee
Pail, Garbage-.....I. H. Taylor
Pails, buckets, &c., Reinforcement for.....
.....M. E. Gray
Paper receptacle.....D. J. Jennings
Paraffining receptacles, Machine for.....
.....M. M. Hjermstad
Pavement and making the same.....
.....W. E. Hassam
Pea-separator.....W. S. Pope
Pedal-hiding panels, Operating connection for.
.....J. T. Mayer
Pen, Drawing-.....G. Schoenner
Pen, Fountain-.....A. F. Zahm
Pen holder, Fountain-.....J. A. Robinson
Pen-support.....H. Priester
Penholder, Automatic ejecting...R. H. Wilson
Penholder, Self-ejecting.....E. S. Browning
Pencil-sharpener.....G. P. Suma
Phonographs, graphophones, and the like, Mechanism for the manufacture of cylindrical blanks and records of...E. Traynor et al
Photographic-printing frame.....J. C. Fyfe
Photographic reflector.....S. Holm
Photographs, Utilizing Lippmann.....
.....A. Köhler et al
Piano back, Upright-.....A. Stahl
Picture device, Movable-.....G. Westphal
Picture machine, Moving-.....H. K. Sandell
Pincushion.....R. R. Ellis
Pipe coupling, Automatic train-..R. E. Adrcon
Pipe-cutting machine.....H. H. Fisher
Planer, Crank-.....H. Lutter et al
Plating-rack.....H. V. Smith
Plow.....A. L. Covey et al
Plow.....C. C. Rankin
Plow.....W. H. Goldtrap
Plow-standard clamp.....C. C. Rankin
Plug, Fixed-polarity separable attachment-....
.....H. Hubbell
Pneumatic drill.....M. Hardsocg
Pneumatic-tube systems, Terminal for.....
.....C. H. Burton
Poke, Animal-.....J. W. Tarpley et al
Pole-changer.....W. E. Butler et al
Posts or poles, Ground-anchor for.....
.....E. R. Hobbs
Power-can.....A. F. Foote
Power-meter.....C. E. Vawter, Jr.
Power-transmitting mechanism....G. W. Smith
Presser-foot-lifting mechanism, Automatic.....
.....H. H. Cummings
Printer's gage.....G. M. Beasley
Printing-machine.....J. D. Caldwell
Printing or stamping attachment for paper-holding stands.....E. Gallozzi
Printing-press.....L. W. Southgate
Printing-press.....C. G. Harris et al
Printing-press registering device.....
.....E. L. Bogasch
Propeller.....F. S. Parsons et al
Propeller, Ship's.....P. Filippi
Pump.....H. Cline
Pump, Breast-.....J. S. Gilbert
Pump, Multistage centrifugal.....C. Lager
Pump, Vacuum-.....J. Zeitlin
Pump valve, Mine-.....R. W. Murray
Pump, Wind-driven.....E. Eggleston
Punch.....A. H. Moulton
Punch-shifting mechanism.....
.....C. H. De La Monte
Punitive device.....J. R. Hinton
Puzzle.....W. Martin
Pyrometer.....C. Féry
Rail-joint.....S. Kühnle
Railway-rail chair.....J. F. Lewis
Railway-signal.....A. G. Clark
Railway-signal system.....A. Wilhelm
Railway-switch.....J. M. Hipp
Railway-tie.....E. Covington
Railway-tie.....W. I. F. Harden
Railways, Contact-box for electric.....
.....G. H. McFeaters
Receptacle, Flexible.....T. Iwanami
Refrigerating apparatus.....A. R. Sprague
Refrigerator.....L. McReynolds
Refrigerator track-door.....R. E. Jones
Relay-controller, Multiple-series.....
.....C. T. Henderson
Reproducing objects.....J. H. Smith
Resistance coil, Variable-.....H. A. Wallace
Retort.....C. F. McKenna
Return-ball.....J. P. Newbold
Riveter.....H. Cordell
Rolling-mill.....F. C. Biggert, Jr.
Rolling-mill table.....J. S. Worth
Rope carrier, Fall-.....A. Lambert
Ropeway-carriage.....W. Ellingen
Rotary cutter.....W. C. Evans et al
Rotary engine.....K. A. E. Andreas
Rotary engine.....J. C. Pfeiffer
Rotary engine.....U. G. Mayberry
Rotatable spindle and bobbin.....C. A. Smith
Rule and level, Plumb.....J. Morrison
Rule, Foldable.....C. L. Brush
Running-switch and guide.....T. J. Driver
Saddle, Riding-.....J. G. Graf
Saw jointer and side-filer, Circular-.....
.....R. A. Todd
Sawmill operating mechanism..J. N. Brownlee
Scaffold-clamp.....W. Shears
Scissors.....G. R. McAllaster
Screw-threading machine.....J. O. Dixon et al
Sealer, Envelop-.....L. O. Stassart
Sewing-machine bobbin-holder...C. B. Atwood
Sewing-machine bobbin-holding attachment....
.....A. W. Christensen
Shade-roller and curtain-pole support.....
.....R. F. Espig
Shock-loader.....T. Robson et al
Shoe.....F. A. Critz, Jr.
Shoe-tree.....B. L. Rinehart et al
Shoulder-pad.....D. W. Bartran
Shuttle motion, Fly-.....E. H. Baber
Siding gage or marker.....W. Dickman
Sign-board.....J. R. Fitzgerald
Signal and spring-jack, Combined.....
.....J. L. McQuarrie
Signal-tower.....J. H. Markley
Siphon.....D. Landau
Sizing-classifier.....W. L. Card et al
Sizing-machine.....G. Masurel-Leclercq
Skiving-machine.....D. N. Robertson
Slicer, Bread and vegetable.....W. Hazzard
Smoker's appliance.....C. West
Snap-hook, Breast-strap.....J. B. Baxter
Soda-fountain.....C. F. Kurz
Soldering chain-links.....M. Fessler
Soldering chain-links, Apparatus for.....
.....M. Fessler
Sole attachment, Shoe-.....J. F. Mitchell
Sound-reproducing machines, Stylus for.....
.....S. Levin
Spark-arrester.....F. R. Minkler
Spark-oulg protector.....C. H. Stuart
Speed-recorder.....H. Walder
Spinning and twisting device, Yarn.....
.....D. Despradelle
Spinning-frame roller.....S. D. Hammett
Spool-holder.....S. McBride
Sprinklers, Emergency-stopper for automatic..
.....J. P. Casey et al
Stamp attachment, Printing-....M. E. Crowley
Steel ingots, Manufacture of small.....
.....A. Rudgear
Stenciling-machine, 2 pats.....S. T. Smith, Jr.
Stocking-turning machine.....W. J. Anderson
Stool.....C. A. Burns
Storage apparatus.....A. C. Williams
Stove-grate.....E. Senn
Strainer for fruit, &c., Collapsible.....
.....A. M. Stocking

Strainer, Well-....A. M. Brown
Sulfur dioxid of commercially uniform temperature and concentration, Producing....J. L. Tufts
Supporting-rack....J. S. Bunnell
Suspenders and the like, Adjustable fastener for....G. Newman
Swah-stick attachment....E. Wollgien
Switch-lock....W. Anderson
Switch operating device, Automatic-....R. R. Miller
Switch-throwing mechanism, Electric....W. H. Turner
Syringe....A. E. Macdonald
Table attachment for chairs, &c....I. N. Johnson
Table lock, Extension-....E. Tyden
Talking-machine sound-box....T. Kraemer
Tamping-machine....A. F. Kellner
Target-spotter....R. S. Henry
Telegraphy....I. Kitsee
Telegraphy, Printing....I. Kitsee
Thill-coupling....C. C. Bradley
Thill-coupling....H. Paar
Threshing-machine....O. O. Berquam
Ticket ejecting and registering device....I. Fluegelman
Tire armor, Rubber-....V. L. Békefi
Tire-protecting device....C. D. Moore
Tire-setter....D. Ballenger
Tire, Spring-....B. Hilger
Tire, Vehicle-....E. L. Easlick
Tobacco-leaves, Decoloring....L. L. J. Parant et al
Tobacco-pipe....F. F. Austin
Tongs....C. E. Hansen
Tool, Combination-....J. P. Shaw
Tool holder, Multiple-....F. J. Brewer
Toy....M. E. Tynes
Trace-carrier....O. Olson
Train-lighting system....J. L. Woodbridge
Train-stops, Circuit-closer for automatic....J. H. Lynch
Transformer, Electric....L. Maiche
Transformer, Variable-voltage..E. F. Gehrkens
Transformer, Variable-voltage....M. O. Troy
Transmission mechanism, Mechanical variable-....B. E. Scrivin et al
Transporting-receptacle....C. H. Cronk
Tray, Serving-....O. Heise
Tree branches together, Means for tying....J. A., J., and M. L. Davey
Tree, Treating and dressing a bruise or wound in the trunk or live branch of a live....J. M. L., and J. A. Davey
Trellis....L. I. Waite
Trolley....J. C. Wilkins
Trolley-wheel....T. Langen
Trousers....A. G. Peine
Truck, Rigger's....J. Ross
Trucks, Bearing for car-....O. F. Transue
Tuning, Method of....M. L. Severy et al
Turbine, Elastic-fluid....C. Fox
Turbine, Elastic-fluid....E. Thomson
Turbine, Steam-....R. Schulz. (Reissue.)
Twyer-stock cap....R. B. Doud
Type casting and setting machine, Printing-....J. Pinel
Type-writing machine....C. B. Schultz
Type-writing machine....J. C. McLaughlin
Type-writing machine....J. C. Doane
Type-writing machine....J. Hutchinson
Type-writing machine....E. L. Pfunder
Umbrella-holder....K. A. Perkins
Unipolar machines, Protective device for....J. E. Noeggerath
Valve....J. D. Coleman
Valve....P. B. Johnson
Valve....P. Connolly
Valve-controlling mechanism, Motor-truck....W. A. Roberts et al
Valve, Cylinder-relief....H. W. McCombs
Valve for graduating release, Triple....W. V. Turner
Valve for radiators, Air-....F. W. Leuthesser
Valve, Gas-....A. Jarmolowsky
Valve, Gate-....H. A. Hansen
Valve, Graduating triple....W. V. Turner
Valve, Relief-....W. F. Krichbaum. (Reissue.)
Valve-remover....B. A. Swenson
Valve, Throttle-....G. W. Morris
Vehicle-brake....J. G. Weller
Vehicle brake mechanism, Self-propelled-....H. Lemp et al
Vehicle controlling mechanism, Motor-....C. H. Humphreys et al
Vehicle driving mechanism, Motor-....W. H. Douglas
Vehicle, Motor-....R. Huff
Vehicle-spring....N. Hee
Vehicle-wheel, Pneumatic..B. J. Macaulay et al
Vehicles, Awning and dust-screen for....H. S. Samuel
Vehicles, Equalized oscillating gear for road-....L. H. Campbell
Vehicles, Steering gear for road-....L. H. Campbell
Vehicles, Weather-screen for motor-....J. Lingley
Velocipede....G. E. O'Connor
Vibrator, Liquid-actuated....C. H. Richwood
Vibratory apparatus, Therapeutic....J. M. Tourtel et al
Vise....W. E. Canedy
Voting-machine....W. H. Strong
Wagon-standard....A. H. Harshbarger
Waist, Nursing-....I. G. Culver
Wardrobe and disinfecting-cabinet, Combined...A. S. Hitchcock
Warp-stop-motion detector....J. P. Webber
Washboard or attachment thereto....F. G. Philpott
Washing apparatus....C. M. Harrison et al
Washing-machine....A. A. and D. D. Rullman
Watches, clocks, and the like, Movement-plate for....W. E. Porter
Water-power engine....M. Haukhey
Waves of the sea, Apparatus for utilizing the force of the....P. Morice
Weather-strip....P. L. Hedberg
Well packer, Deep-....C. M. Heeter
Wheel-rim....E. Hopkinson et al
Winding-machine....J. G. Callan
Window....O. M. Edwards
Window....C. D. Tabor
Window....S. U. Barr
Wire-drawing apparatus....G. A. Hoyt
Wire fabric, Intermeshing....M. Scougale
Wire straightening and coiling machine....R. L. Horsley
Wire-stretcher....S. Tyer
Woodworker's clamp....C. Mouthuy
Woodworking-machine....N. Winberg
Wrench....J. F. Lansing
Wrench....S. Longanecker
Yoke attachment, Neck-....R. K. Stevens

DESIGNS.

Bottle, Poison-....W. V. Johnston
Fob....C. O. Nash
Hinge-leaf....O. E. Brandt

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Account-register....S. Klepfer
Air-brake apparatus....H. B. Miller
Alarm device....G. W. MacKenzie
Aluminates, Manufacture of....O. Dieffenbach
Amusement device....A. Visser et al
Amusement device....S. E. Chapman et al
Anchor, Line-....J. Pawolowski
Arsenic from liquids and gases, Removal of, 2 pats....O. Jonas
Artificial tree....G. Spreen
Automobile-radiator....M. Steiner
Automobiles, Power device for moving....B. J. French
Awl, Sewing-....J. W. Morgan
Baling-press....P. K. Dederick
Bearing....J. S. Worth
Bed, Davenport-....A. T. Mayer
Beehive, 3 pats....L. A. Aspinwall
Bell and alloy for same....E. W. Vanduzen
Bicycle-support....J. C. Scoggins
Binder....W. E. Dickson
Binder, Loose-leaf....E. Fournier
Blasting-powder....H. D. Farris et al
Blower, Duplex rotary....E. P. Reichhelm
Blowing engine or pump....G. B. Petsche
Blue-print washing and drying machine....C. F. Pease
Boat-releasing device....K. J. Daly
Boiler and other furnace....C. Moche et al
Boiler-flue fastener....W. E. Parkinson
Boiler-furnace....W. Cassens
Boiler-furnace....D. Taggart
Book, Hook-....P. V. Ericson
Bottle cap or closure for bottles, jars, or other receptacles....E. Goltstein
Bottle, Non-refillable....R. A. Little
Bottle, Non-refillable....W. Winters
Bottle, Non-refillable....A. W. Hagstrom
Box-form-cutting machine....W. F. Morse
Box-lid holder....A. C. Olander
Brake mechanism for cars, elevators, cranes, and other purposes, Electric...M. E. Neenan
Brick-handling device....A. O. Jones
Bridge construction....H. Friend
Bridle-bit....J. W. Herbert
Brooder or incubator....J. H. Turcotte
Brush....A. R. Wiens
Brush....W. J. Wilson
Bucket, Clam-shell....C. W. Hunt
Bucket, Clam-shell....C. C. King
Buckets, Means for dumping or discharging materials from....H. A. L. Barry
Buckle....R. Baird
Buggy-top fastener....G. J. Wenzlick
Buggy-top retainer....R. L. Allison
Building-block....D. O. Loy
Built-in closet....W. H. Watts
Burners, Automatic cut-off for liquid and gaseous fuel....V. E. Campbell
Button, Collar-....B. Brand
Button, Detachable....P. M. Coyne
Camera, Enlarging-....R. Kroedel
Can-body-making machine....L. C. Sharp
Can-opener....J. F. Ruff
Car and tool-driving machine, Track-....H. W. Jacobs
Car-body corner-stay....H. H. Dewey
Car-fender....H. L. Libby
Car, Railway-....P. Butchart
Car, Railway-....W. M. Ryan
Car-spring....T. A. Shea
Car stop and speed signal....J. F. Bush
Car-underframe, 3 pats....C. S. Shallenberger
Car-wheel....W. D. Lowry
Cars, Running-board saddle for...W. H. Miner
Carburetor for explosive-engines....P. H. Brennan
Carpet-stretcher....T. Walker
Carpet-stretcher....R. R. Shapley
Carriage-shift and platen-rotator....O. A. Luce et al
Cartridge feeding device for machine-guns or the like....F. Ruszitszka
Casting chilled rolls, Mold for....R. H. West
Cattle-guard....E. A. Manny. (Reissue.)
Centrifugal machine....B. Ljungström
Chair and couch, Combined....L. A. Erickson
Change-making machine....J. T. Garton
Check, Baggage-....G. W. Conrad et al
Churn....J. B. Davis et al
Churn, Rotary....S. A. Ekehorn
Cleaning composition....J. F. Washington
Clothes-bar....J. S. Bowen
Clutch....J. G. Heaslet
Clutch, Friction-....T. W. Morgan
Clutch, Friction-....G. Enrico
Coal-washer jigs, Mechanism for controlling the gates of....W. M. Duncan
Coating device....N. H. Pike
Coffee-pot....P. Renner
Coke-oven apparatus....T. J. Mitchell et al
Collapsible joint....H. W. Martin
Combustion-chamber....S. A. Moss
Commutator-motor, Single-phase..S. S. Seyfert
Concentrator, Dry....H. P. Curtis
Concentrator for solutions....J. U. Lloyd
Concrete block....J. W. White
Concrete-block-forming machine....J. Ingells
Concrete chimney-block....J. W. White
Concrete-mixer....S. Knisley
Concrete-mixer....G. P. White
Conveyer, Spiral....G. P. Wisdom
Conveyers, Filling apparatus for..C. W. Hunt
Cord-clamping device....J. B. Lee
Corer, Pineapple-....J. Lindsay
Corkscrew....C. H. Hutchinson
Corsets, Abdominal supporting attachment for..G. Lanzendorfer
Cotton-gin....L. H. Dyer
Cotton-picking machine....R. C. Scherling
Coupling....M. Forder
Coupling....T. B. McMillan
Crank mechanism....T. Baden
Curling-tongs....A. Altstaedten
Curtain-fixture....J. Kroder
Curtain-pole....W. H. Sippel
Cut-out, Thermal....C. A. Ernst
Dental chair....F. E. Case
Dental plates, Mold for making...J. W. Greene
Dental tool....E. Y. Haughawout
Dental tool....J. H. Abbott
Derrick and excavating-machine, Steel....C. Cooper
Dish-warmer....R. L. Washington
Ditching, digging, and loading machine....J. U. Hare
Door-lock....W. D. McPherson
Door-operating device....J. M. Sausser
Door or window securer....A. W. Peterson
Dough-divider....F. Streich
Draft-evener....J. D. Burgess
Drafting instrument....W. Langstroth
Drag, Road-....H. J. See
Drills, Grinding-tongs for spiral....O. Schöbe
Drum....G. Wilken
Drum-stand....E. F. Howe
Drying and carbonizing kiln, Continuously-operating....R. Bock
Dumping apparatus....H. L. Allen
Dye and making the same, Red vat....A. Grob
Eaves-trough, 2 pats....G. Cassens
Ejector-ventilator, Stationary....A. J. Leitch
Electric heater and means for controlling the same....P. A. Brown
Electric machine, Dynamo-....R. B. Williamson
Electric machines, Clamping means for core-plates of dynamo-....C. E. Lord et al
Electric machines, Method of and means for starting dynamo-....B. Frankenfield
Electric regulator, Automatic....W. L. Bliss
Electric service cut-out and meter-board, Combined....H. E. McGowan et al
Electric traction system....S. H. Hoopes, Jr.
Electrical apparatus....C. J. Klein
Electrical connection device and the like, Flexible....C. A. Keller
Electroplating rods, pipes, &c., Means for....D. H. Murphy
Electrothermal protector....F. B. Cook
Embroidery work....R. Cornely
Engine base and crank-case, Hydrocarbon-....H. B. Joy
Engine, Means for preventing reversing of an explosive-....W. B. Potter
Engine-starter....C. B. Lazenby
Engines, Water-injector for internal-combustion....A. G. Scholes et al
Ensilage-distributer....W. E. Draper et al
Envelop....W. Macdonald
Evener, Four-horse....W. R. Campbell
Evener, Three-horse....A. L. Simon
Exhaust-regenerator system....A. C. E. Rateau
Explosive, Stable....F. B. Holmes
Extinguisher, Automatic....T. Falkovsky
Farm-gate....M. M. Lamb
Fasteners, Machine for driving....A. F. Preston (Reissue)
Faucet, 2 pats....J. W. Nethery
Feed-water heater....D. Brews
Feeder, Chicken-....G. E. Gibson
Fence-post base....O. J. Snider
Fertilizer-distributer....D. B. Merrell
File clamp and guide....R. S. Brown
Filter....J. G. and O. B. Heitzman
Filter-press....E. M. Bassler
Fire and temperature alarm or indicator....G. L. Smith
Fire-plug and collapsible joint...H. W. Martin
Firearm....A. P. Brush
Firearm-indicator....J. J. Peard
Firearm, Non-recoiling....L. Mertens
Firearms, Firing-pin-locking device for....G. H. Tansley
Fish-plate....J. Pawolowski
Flax-pulling machine....E. McCauley
Flush-tank....J. Nelson
Fog-penetrating light....E. Maurer
Fold-holding device....H. T. Pitcher
Fruit-gatherer....A. Reiniche
Fruit-grader....W. C. Anderson
Furnaces, Blast-heating apparatus for....W. A. Wheeler
Furnaces, receiving vessels, or the like, Charging device for....L. Mond
Fuse....B. A. Brown
Game apparatus....J. C. Fair
Game apparatus....H. J. Finlay
Garment....H. S. Dean
Garment attachment....C. H. Burkham
Gas and other engine....J. S. Miller
Gas-burner....B. A. Geuring
Gas-burners, Automatic cut-off for..R. H. Cooke
Gas-engine....M. A. Trow et al
Gas-engine....M. V. Robinson et al
Gas-generating apparatus....A. D. Brasson
Gas generator, Acetylene-....W. E. Travers
Gas generator, Acetylene-....O. H. Hasneder
Gas-producer....S. W. Rushmore
Gas trap, Sewer-....W. J. Wilker
Gas-washer....O. E. Gressly
Gear mechanism for vehicles, Change-....G. Enrico
Gearing, Change-speed....W. E. Goodyear
Gas-blown dose-measuring bottles, Device for bending the necks of....A. W. Hutchins
Glass-leers, Door arrangement for....A. H. Heisey
Governing mechanism for oil or gas engines....S. A. Moss
Grain-screening machine....A. H. Baenen
Grain-separator screen....H. J. Folts
Gramophone-machines, Turn-table for....E. H. Mobley
Grease-cup....G. F. Brettell
Guns, Single-trigger attachment for double-barreled....A. D. Blanchard
Halter....J. Hegland
Harness attachment....G. W. Brown
Harvester attachment, Corn-....L. Carter
Harvesting-knife....A. W. Ihde
Hat-frames, Device for making wire...B. Belle
Hay, &c., Apparatus for handling..C. W. Wood
Heat for cooking and other purposes, Apparatus for the electrical production of..A. F. Berry
Heater....E. J. C. A., Sr., and C. H. Droz
Heel....C. L. Whiting
Heel-building machine....C. O. Ryberg
Hides, skins, and leather, Machine for treating....F. H. Teel
Hinge....J. Diehl
Hinge-gage....W. A. Durst
Hoe....H. S. Earle
Hoisting and conveying apparatus..J. McMyler
Holdback-iron....R. B. Carpenter
Hook, 2 pats....L. P. Greenman
Hoop....R. Studer
Hot-water heater....G. L. Bennett
Ice-cream cooler and soda-fountain....W. H. Wallace
Igniter....C. B. King
Igniter....W. L. Wayrynen
Index....F. E. Smith
Indoxylic compounds, Producing..H. Labhardt
Induction-coil....D. H. Yost
Internal-combustion engine....J. H. Pierce
Internal-combustion engine....H. H. Benson
Ironing-machine....A. S. Emerson
Jack....B. C. Williams
Jar holder, Fruit-....G. M. Corsey
Jarring-machine....W. Lewis
Kinematograph and like apparatus....A. Mallet
Kinematographs, Safety attachment for....A. Mallet
Knee-pad, Pneumatic....P. P. Gibbs
Knockdown chair....J. R. Koen
Labeling-machine....F. Szlubis
Ladder....C. D. Phipps
Ladder....J. R. Rupe
Ladder, Combination-....F. E. Scott
Ladle for molten metal....G. A. Hassel
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Lamp-burner....J. D. Westmoreland
Lamp burner, Oil-....J. and M. Lawson
Last, Adjustable....J. Bronenkant
Last-lathe center....C. P. Morton
Latch-keeper for gates....R. D. Browning
Lead, Treating anode slime from the electrolytic refining of....A. G. Betts
Lead, Treating slimes from electrolytic refining of....A. G. Betts
Leather, Reinforced....Z. S. Blackadar
Lifting-jack....F. C. Butler et al
Lock face-plate....O. F. Sparks
Lock-mortiser....J. E. Doldt et al
Locomotive-tender tanks, Coal-space in....J. W. Harkom
Logging-car stake....O. S. Carroll et al
Logging-cart....T. A. L. Strange
Loom stop-motion and reversing mechanism....E. Hollingworth
Lubricating mechanism....J. Hutchings
Lubrication system, Forced-....F. Samuelson
Lubricator for main bearings of centrifugal breakers....W. Langenheim
Mail-bag catcher....P. B. Southworth
Mail-bag catcher....J. H. Tudor
Mail-bag deliverer and catcher...A. S. Parker
Mail-chute....R. W. Ashley
Mail-pouch catcher....W. E. Allen
Mail-pouch deliverer....W. M. Rawl
Mailing-wrapper....H. L. Greve
Manure, lime, or the like, Machine for distributing artificial....P. Grundmann
Manure-spreader....J. L. Barker
Map, Route-guide....C. C. Loewe
Match-stand....C. W. Shonk
Matrix and forming same...L. E. Morningstar
Meat-hanger....T. Walsh
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Metal-finishing machine....D. W. Mullin
Metal-sawing machine....W. Lewis
Metal-shearing machine....H. V. Loss
Metals, Device for the purification of....C. T. Knipp
Metals, Purification of....C. T. Knipp
Metallic oxids, Reducing....E. F. Price et al
Metallic tie and rail-fastener....O. M. Boylan
Methane, Oxidation of....M. C. von Unruh
Milk, Modified dry....J. R. Hatmaker
Milking machine, Cow-....W. W. Sprague
Molding-machine....W. Lewis
Molding-machine....H. Tabor et al
Molding-machine....G. Dunkel
Mop-making machine....L. Stocker
Mops and brushes, Machine for making....L. Stocker
Mops, Making....L. Stocker
Mortising-machine....G. O. Westlund
Motor controller, Electric-....J. Dillon
Motor-controlling device....W. C. O'Brien
Motor starter, Electric-, 2 pats...W. C. O'Brien
Mower....I. Gallagher
Music-leaf turner....R. E. Ebersole
Musical-device pneumatic apparatus....R. A. Gally
Musical-device wind-inducing apparatus....R. A. Gally
Musical instrument, Mechanical...G. B. Kelly
Nose-bag....J. A. McColeman
Nut-lock....E. O. Wheelock
Nut-lock....W. McGhie
Nut, Lock-....H. J. Swain
Oil-switch, Rotary....H. L. Van Valkenburg
Oiling system for engines....M. W. Smith
Operating and fracture table....J. H. Downey
Operating-table....J. H. Downey
Ordnance, Device for sighting and training quick-firing....A. T. Dawson et al
Ore products, Treating crushed..W. A. Caldecott
Ore-reducing furnace....J. T. Jones
Ore-roasting furnace....W. H. Smyth
Ore, Treating, 2 pats....J. T. Jones
Overhead switch....R. B. and W. Louden
Package-carrier....J. D. Lane
Package-handles, Machine for inserting wires in....C. Reynolds et al
Packing-box....E. P. Lehmann
Packing Rod-....R. L. Ambrose
Pail, Dinner-....H. Barkley
Paint, Manufacture of an antifouling....J. F. den Ouden
Paper-bag forming and making machine..A. Day
Paper box....H. C. Paris
Paper cups, Machine for making..C. Tietzmann
Paper to corrugated packing-boards, Applying surface....W. H. Latus
Pattern package, Dress-....W. J. Flood
Permutation-lock....E. E. Quaintance
Phonograph feed mechanism....H. Schröder
Photographic developing apparatus...P. Abbott
Photographic-plate holder....C. von Unruh
Piano magazine, Self-playing....E. Guthrie
Pianos, organs, &c., Key-bottom for..P. Duffy
Pin-joint....F. W. Goerdes
Piston-rings, Arrangement for tightening....K. Willner
Planter, Potato-....B. H. Pugh
Plants, Compound for combating fungoid diseases of....C. Rumm
Plaster or composition board....G. Rader
Platform and elevating means therefor, Movable....J. Bouscal
Plow....W. H. Jackson

Plow....C. R. Davis
Pneumatic-tube systems, Terminal for....C. H. Burton
Post....H. H. Grissom
Potato-digger....H. P. Hews
Power, Generation and transmission of motive....G. W. Mascord
Power-press, 2 pats....V. K. V. Palmer
Power-shipping mechanism....W. H. Lafaelle
Power-transmission mechanism....T. Sandera
Prepayment mechanism....J. Gribbel
Pressure-regulator....J. Danischevski
Printer and register, Ticket....O. A. Brown
Printers' galleys, Lock for....G. R. Boyte
Printing and registering apparatus, Ticket....H. Friedlein
Printing and registering apparatus, Ticket....N. Lebeis
Printing press, Two-color-..H. A. Agricola, Jr.
Propeller....A. T. Phillips
Provision-rack....C. H. Boeck
Pulp fiber, Machine for forcing articles from....F. C. Emrick
Pulverizer....E. A. Evans et al
Pump, Vertical-shaft centrifugal....A. W. Hunsaker
Punch, Metal-....E. K. Abery
Pyrographical device....H. Holton
Radiator....A. Harrison
Rail-fastener and anticreeper..W. E. Striker et al
Rail joint and brace....L. T. Joerden
Rail-splice....J. A. Kretzer
Rail tie and fastener....T. Johnson
Railway-crossover....G. W. Wrightson
Railway-rail....W. T. Farley
Railway-signal....F. Hirt
Railway-signal....G. D. Cox
Railway signaling system....L. H. Thullen
Railway-switch, Automatic....A. R. Levy
Railway-tie....H. P. White
Railway-tie....C. A. Reed
Railway-tie and fastening....C. J. Everhard
Railway-tie, Metallic....A. S. Bouchard
Railway-tie, Metallic....A. S. Bouchard et al
Railway-trains, Automatic stop for....J. T. Humphreys
Railway-trains, Means for controlling pneumatic signal-pipes on....W. S. De Camp
Rake attachment, Hay-....S. B. Severson
Range, Kitchen-....A. Frondel
Ratchet-wrench....M. H. Mills
Receptacle for materials to be applied with a brush....C. F. Jenkins
Receptacle, Knockdown....J. W. Dulaney
Rectifiers and rotary converters, Automatic regulation of....F. B. Crocker
Refrigerating apparatus employing carbonic acid....F. E. Müller
Refrigerator....C. H. Boeck
Refrigerator and heater, Combined..J. A. Seeger
Register or manifolding machine..J. T. Sullivan
Reinforcing-bar for cementitious bodies....E. F. Crane
Rheostat, Liquid....H. W. Cheney
Ripper and thread-drawer, Safety..E. E. Sulzer
Rock-drills, Valve for operating...G. A. Fowler
Roofing-strip....F. C. Overbury
Rope and cable grip....R. Schütz
Rope-bracket....O. M. Stalson
Rotary engine....K. H. Korhonen
Rubber foothold....E. A. Strang
Ruling device, Multiple-....P. C. Hayden
Safe, vault, &c, 2 pats....A. W. Marr
Safety-pin....A. G. Kaufman
Sandpapering machine, Floor-....F. Harbers
Sash-balance....C. H. Ocumpaugh
Sausage-stuffer....W. O. Thompson
Saw, Swing-....C. L. Newell
Scale, Beam-....L. Fritz
Scissors....J. Feinenburg
Scoring or counting apparatus....L. A. Rabinowitsch
Scraper, Roll-....W. I. Hill
Seal....C. J. Reynolds
Seal and protector for knots....M. Dessauer et al
Sealing-cap, Metallic....R. E. Meyer
Sealing machine, Bottle-..A. L. Weissenthanner
Sealing machine, Envelop-....J. A. Markoe
Seam for metal pipes, Lock-....W. C. Smith
Seed-tester cup....A. G. Weander
Self-playing instruments, Reed mechanism for....G. B. Kelly
Separator....R. W. Jessup
Separators, Feed for grain, ore, and mineral....W. Gray
Sewage disposal, System of....F. P. Smith
Sewing and ruffling machine..R. G. Woodward
Sewing-machine binding attachment..F. Wever
Sewing shoe-soles to uppers....J. A. Rhoult
Shade and curtain fixture, Window....F. E. Huggins
Sharpener, Lawn-mower....J. F. Hocker et al
Sheet-metal article....H. B. Fuller
Shingle-strips, &c., Machine for cutting....F. C. Overbury
Shock-absorber....A. Dutrieux
Shock-absorber....F. Doront
Shoe-upper binder, Temporary..J. W. Lippold
Shoes, Cushion for....W. A. Preble
Show-case, Article-delivery....J. B. Hurd
Shutter, Focal-plane....J. D. Garfield
Shutter-operating device....E. A. Chegwidden et al
Sighting instrument....A. König
Sintering apparatus....E. B. Clark et al
Skee-stirrup....C. Nordlander
Skin-preserving covering....V. and L. von Alpenburg
Skins, Apparatus for washing sheep-..C. Dufour
Skirt-marker....C. E. Campbell
Skirt-supporter....W. W. Schwotzer
Slag from tin-smelting furnaces, Treatment of....G. T. Holloway
Small-arms, Safety locking device for....J. Tambour
Smelting-furnace....E. A. A. Grönwall
Smelting-furnace....W. J. Holzapfel
Smelting-furnace....J. S. Loder
Smelting ores....F. L. McGahan
Smoke-preventing furnace....S. L. Sheuerman
Smoke-preventing furnace...A. W. Puddington
Snap-hook, Breeching....F. W. Covert
Sound-recording apparatus....C. L. Chisholm
Sound-reproducer....A. N. Pierman
Speed-limiting device....A. L. McHugh
Spinning paper strips, Machine for....E. Jagenberg
Spring-wheel....S. S. and W. Childs, Jr.
Spring-wheel....G. Ferrando
Spur-center....J. E. De Marey
Stacker, Pneumatic straw-....S. B. and H. W. Smith
Stalk-puller, seeder, and pulverizer, 2 pats....R. J. Bogue
Stamp-affixer....F. L. Jennings
Stamp-affixer and envelop-sealer....F. L. Jennings
Stamp-mill....F. I. Matthews
Steam-generators, Mud-collector for..H. Poron
Steam-trap....J. Collis
Steamer, Wheat-....K. Dougan
Steering steamships and other vessels, Apparatus for....J. S. Clarke
Stenciling-machine....B. P. Fortin
Sterlizing-cabinet....J. M. Allspaw
Stone-gathering machine...E. B. Lamme et al
Stovepipe-locking device....A. W. Hoyer
Sweeping compound, Floor-....C. R. Cave
Switch device, Limit-....S. H. Kammacher
Switch-operating apparatus....F. Duffy
Switch-operating machine, Electric-....L. A. Hedger
Switch-operating mechanism....J. W. Keating
Syringe, Earth-....J. Saguin
Tank cleaner, House-....J. O'Connor
Target, Rifle-....C. Reid
Teeth, Means for attaching crowns to roots of....C. A. Davis
Telephone system....N. H. Suren
Telescope for surveying instruments....F. Heitzler
Thill coupling and support, Antirattler..W. Cox
Tie-plate, Interlocking....J. G. Toy
Tin-scrap-treating apparatus....M. Leitch
Tipple, Coal-....R. M. Bickley
Tire-armor....H. G. Wheeler
Tire-bolting machine....J. A. Hemsley
Tire for wheels of vehicles, Pneumatic....A. Michelin
Tires, Ring of removable mail-covers for pneumatic....S. A. Marazzani
Tongs, Blacksmith and machinist..D. N. Tanner
Towel-rack....P. Valliere
Towing system....W. L. Merrill
Toy film-burster....H. Cottrell
Train-controlling system, Electrically-governed automatically-operable....H. B. Miller
Train-pipes, Pneumatic adjuster for angle-cocks on....W. S. De Camp
Train-stop, Automatic....J. H. Lynch
Trains, Means for automatically stopping....G. W. Hunt et al
Transformer, Electrical....A. R. Luschka
Trap....B. F. Brown
Trolley....A. Molnar
Trolley for electric cars and the like....E. J. Dacey
Trolley-track....T. C. Prouty
Truck, Car-....H. C. Buhoup
Truck or wagon, Brick....H. H. Oberly
Truck, Rigger's....J. Ross
Tube-post....A. G. Fenyö
Tube-sizing mill....J. S. Worth et al
Tunnel-driving machine....G. A. Fowler
Turbine, Compound steam-....R. Schulz
Turbine, Elastic-fluid....C. P. Steinmetz
Turbine governing mechanism...O. Junnggren
Tying appliance....D. Blacklund
Type-casting machine....A. Schiepe
Type-machine..J. S. Bancroft et al. (Reissue.)
Type-mold....C. Huff et al
Type-writing machine....E. E. Barney
Type-writing machine....G. A. Seib
Umbrella-stick, Sectional....M. W. Munford
Valve....C. Orenstein et al
Valve....R. T. Crane
Valve and valve-gear for steam-engines....O. Holen, Jr.
Valve, Gas-engine relief-....J. W. Hasburg
Valve-operating mechanism....W. B. and E. Runnion
Valve-operating mechanism for hydrocarbon-engines....R. Huff
Vehicle....I. Cowles et al
Vehicle....J. H. Diel
Vehicle front and apron, Combined....W. J. Campbell et al
Vehicle, Motor-....F. J. Mohan
Vehicle-top support....L. L. Allen
Vehicle-wheel....J. Luppino
Vehicle-wheel....L. W. Bryant
Vehicle-wheel....T. A. Baker
Vehicles, Dust-collector for motor-....E. H. Morgan
Vehicles, Radiator-fan for motor-....R. Huff
Vessel-closure....C. Hubert
Veterinary forceps....C. A. Paisley
Veterinary purposes, Medicine-injector for....C. Wuest
Vibrator for movement-cure purposes....J. B. Kirby
Vulcanizer....W. D. Gratama
Wagon-brake....R. A. Griswold
Wagons, Automatic closing mechanism for dumping-....M. J. Ely
Wall construction....S. C. Coyner
Washbowl-stopper....A. Martin
Washing-machine....B. Woerner
Washing-machine....T. J. Winans
Washing-machine gearing...A. B. Christensen
Water-heater, Electrical....H. M. Hill
Water-motor, Current....R. E. Coon
Weather-strip....F. Overfield
Weather-strip....O. T. Akre
Wheelwright-machine....J. G. Stoen
Wind-shield....O. C. Graff
Wind-wheel....M. Bradford
Window and door screens, &c., Joint for....J. H. Diamond
Windows, Antirattler for....A. O. Leger
Windrowing attachment....W. Gaterman
Wood-preserving compound....H. E. Percival
Wood-trimming machine....E. P. Webster
Woodworking-machines, Feed-roll for....J. G. Paul
Worts, Manufacture of....V. Lapp
Wrench....R. W. Hope et al
Wrench....D. F. and J. J. Geiger
Wrench....W. A. Flowers
Wrench....T. J. Turko et al
Yoke attachment, Neck-....L. Carey

DESIGNS.

Badge....C. J. Dieges
Bottle....H. C. Powers
Display-stand, Revolving....E. Berolzheimer
Emblem or badge....C. Brinton
Lamp....H. H. Eason
Lamp....O. Ste. Marie
Lamp-shade....L. W. Rice
Necktie....A. J. Bendix
Picture-frame....J. P. Staderman
Ring....I. C. Hartzell
Ruching....L. Kramer
Spoons, forks, or similar articles, Handle for....G. Strohhaker
Spoons, forks, or similar articles, Handle of....J. Habensack
Type, Font of....S. C. Gaunt

Issued June 30, 1908.

MECHANICAL PATENTS.

PATENTS WERE ISSUED ON THE 30TH DAY OF JUNE, 1908.

Adding-machine attachment....C. L. Becker
Adjustable chair....L. G. Schussmann
Adjustable table....J. W. Cash
Advertisements, Mechanism for displaying....C. A. Bengtson
Aerodrome or flying machine...E. R. Mumford
Air-brake apparatus....A. H. Geltz et al
Air-brakes, Automatic drain-cock for....F. W. Adams
Air-compressor....J., Jr., and J. Thorton, Sr.
Alcohol from liquor casks and barrels, Apparatus for recovering waste...T. H. Naughton
Alcohol from liquor casks and barrels, Recovering waste....T. H. Naughton
Alloys, Producing low-carbon....F. M. Becket
Ammonium chlorid, Producing...E. Naumann
Amusement device....F. W. Murphy
Animal-trap....T. F. Timby
Animal-trap....W. C. Smith
Animal-trap....G. Davis
Arhors, Device for attaching index-fingers to....A. Wirsching
Armature-core....J. F. Card
Article-holder....G. P. Fay
Asphalt plant, Portable....F. B. Smith
Atomizer....J. Cooperider
Automatic light....E. Newman
Automobile-wheel....K. Kohlmann et al
Axle device, Differential..B. R. Seabrook et al
Bag-fastener....J. J. Tavis
Bag-holding mechanism....P. Rudd
Baggage-roper....W. Barrott
Barrel, Steel....F. E. Young
Barrels, Pitching....J. H. G. Zunner
Battery-well....C. F. Massey
Bearing, Ball-....F. C. Mason et al
Bearing, Roller-....J. Taylor
Bed, Folding....O. Baignè
Bed sheet, Hospital-....A. C. Halterman
Beet-loader....D. Barney
Binder-lock....G. A. Shoemaker
Binder-lock....C. Daniels
Binder, Temporary....W. M. Raynor
Binding-post....N. Sohl
Biological specimens, Means for mounting and preserving....E. Bade et al
Blackboard and writing-desk, Folding-....M. T. Bedford
Blotter, calendar, ruler, measure, and paper-cutter, Combined....H. T. Crane
Blowing-engine or compressor...G. B. Petsche
Board-smoothing machine....C. A. Eidam
Bobbin and whirl....J. W. Collins
Book holder, Note-....F. W. Mosher
Bookbinder....J. Weisbrod
Bookbinding....C. Chivers
Boot-calk....L. H. Maxwell
Bottle and a combined stopper and dauber therefor, Polish-....C. A. Moltane
Bottle cap or stopper....J. H. Rese
Bottle caps or stoppers, Apparatus for making....J. H. Rese
Bottle, Indicating-....W. C. Schmidt
Bottle, Non-refillable....C. C. Guernsey
Bottle or container, 2 pats....H. D. Thatcher
Bottle, Protected....B. C. Wickes
Bottle-stopper....J. I. White
Bowling score-board....M. J. Harwood
Box....E. E. Flora
Box....W. J. Paton
Box-fastener....A. T. Kruse
Box-lid holder....J. Blumer
Box or crate for bottles, jars, and the like....C. M. Bradnt
Brake apparatus, Load-....P. Synnestvedt
Brake mechanism, Fluid-pressure, 2 pats....J. H. Bleoo
Brake-shoe....C. D. Pettis
Brick-carrying device....J. Banwell
Brick-kiln....E. R. McKissick
Brooches and the like, Safety device for....H. A. Ives et al
Brush....J. E. Blythe
Bucket, Dumping-....L. A. Lehmann
Bug-exterminating machine....E. L. Brillhart
Building construction....J. T. Ferres
Buiding construction....C. D. Salfield
Burglar-alarm systems, Relay for....O. Jacobson
Bustle or distender....T. J. Wall
Button and button-fastening....G. W. McGill
Cabinet, Sale-....R. R. Ricketts
Cake-turner....H. L. and H. K. Fairall et al
Can-lifter....W. G. Kennedy
Can-spout....I. E. Sexton
Canning factories, Apparatus for mixing materials in....R. J. Dickinson
Cane-loading device....J. R. Myers
Car-brake....M. G. Wortman
Car-brake, Automatic....J. H. K. McCollum
Car, Double-end dumping-....E. E. Slick
Car, Dumping-....M. H. Treadwell et al
Car, Dumping push-....R. T. Looney
Car-mover....J. S. Peek
Car-release....A. F. Biavati
Car vestibule-hood....W. G. Trethewey
Car wheel and axle...D. P. and H. C. Judson
Cars, Mechanism for handling....G. Holmes
Carbon tetrachlorid, Making....C. E. Acker
Carbureter....A. Jourdanet et al
Carbureter....F. W. Hodges
Card-holder....W. E. Knoder
Carriage-top....C. W. Coops
Cart, Dumping-....H. T. Kingsbury
Casting apparatus....W. S. Weston
Cement-block mold....W. A. Crew
Cement paving....R. Kieserling
Centrifugal machine....B. Ljungström
Christmas-tree holder....S. Peterson
Chuck....R. McCarty
Cigar-case....O. L. Parmenter
Cigarettes with mouthpieces, Apparatus for manufacturing....F. Tore
Circuit-controlling mechanism....G. M. Wills
Clock, Alarm-....M. J. Gallagher
Clock, Ship's-bell....P. Lux
Clothes-line reel....C. H. Bailey
Clothes-tongs....D. F. Porter
Clutch, Friction-....G. D. Miller
Clutch mechanism....L. A. Casgrain
Coin-collector....E. H. Smythe
Coin-sorting mechanism....C. E. Dellenbarger
Coke-extractor....G. B. Foust
Coke-oven apparatus....T. J. Mitchell et al
Coke-quenching machine....P. H. Douglas
Collapsible box or crate....A. F. Miller
Collar fastener, Horse-....W. Terry
Comhers' effluents, Treatment of wool-....E. Dowie
Concrete manifold system....G. W. Knight
Concrete-mixer....J. Fish
Concrete sea-wall....J. H. Tromanhauser
Concrete structure, Reinforced....G. M. Graham
Concrete structures, Core for....J. Vaughan
Controller-operating means....T. Gilmore, Jr.
Cooking-utensil handle, Detachable....C. L. Staudinger
Cooling-apparatus plate....R. Alexander-Katz et al
Cord-holder....M. Mayer
Corn-husking machine....W. S. Baird
Corn-knife, Safety....H. Schwartz et al
Corset-gore-adjusting device....M. Sahlin
Cotton-chopper....E. G. Williams
Cotton-picker....W. F. Spear et al
Cowl....O. Schubert
Crate....G. L. Walburn
Crate, Folding....W. H. Goddard
Crate, Folding, combination poultry and merchandise....A. W. Lovejoy
Crucible-furnace....E. H. Schwartz
Cultivator....W. J. Watson
Cut-off, Automatic....J. H. Stanton
Cycle-wheel gear with means for operating the brake by back-pedaling....E. L. Hocquart
Cylinder-pattern....G. C. Bourdereaux
Dauber....C. S. Emmert
Davenport....H. C. Creedon
Dehydrating sodium hydrosulfite...A. Schmidt
Dental articulator....J. C. Fisher
Derailing-switch....J. H. Covey
Die....B. H. Greene
Display-rack for clothing....E. Brumberg et al
Door....F. Scott
Door and analogous structure, Sheet-metal....T. I. Duffy
Door fastener, Sliding-....J. F. Muirhead
Door, Grain-....E. B. Gilleland
Door opening and closing mechanism....R. F. Carey
Door-operating mechanism....C. G. Harrington
Dough and cracker handling machine....A. W. Copland
Drawing instrument or attachment for such instruments....K. J. Berglind
Drill-bit....J. Patten et al
Drill mechanism, Convertible....O. Arnold
Drying-kiln....C. H. Palmer
Dump, Animal-....J. P. and R. L. Plummer
Dumping-box....J. P. Delaney
Dye, Blue azo....C. Heidenreich
Dye, Diphenylnapthylmethane, 2 pats....M. Weiler
Egg-washing machine....G. J. Whelan
Electric illuminator....H. J. Mullen
Electric-light cut-off....J. B. Smith et al
Electric machine, Dynamo-....E. Mattman
Electric oscillations, System for receiving undamped....O. Scheller
Electric socket-switch....H. Hubbell
Electric-wire splicer....C. J. Dorff
Electrical apparatus, Mounting for....M. E. Launbranch
Electrical conductors, Junction-box for....J. F. Burns
Electrolytic cell....R. B. Ingram
Electromagnet....D. L. Lindquist
Elevated carrier....B. Snyder
End-gate....E. C. Kidd
Engine igniting mechanism, Explosive-....G. B. Hakins
Engine starting means, Explosive-....W. R. Webster
Engines, Electrical automatic stop for gasolene-....C. Echard et al
Engines, Fuel-feed system for internal-combustion....F. W. Brady
Engines, Safety-crank for internal-combustion....N. W. Hartman
Engines, Sparking igniter for explosive-gas....F. A. Feldkamp
Engines, System for the ignition of the gaseous mixtures in explosive-gas....F. A. Feldkamp
Engineering instruments to their supports, Device for attaching....R. V. R. Reynolds
Excavating-machine and the like....G. W. Jackson
Excavating-tool....P. Scott
Explosive....W. S. Pierce
Explosive mechanism, Repeating....H. A. Bierley et al
Extensible case....E. G. Schriefer
Eye for shoes, &c....J. P. Brooks
Fabric drying and finishing machine, Textile-....G. S. Cox
Feed regulator, Boiler-....H. E. Cade et al
Feeding-trough....F. McArthur
Fence-post, Indestructible....J. S. Moore et al
Fender....J. H. Mauldin
Fertilizer, Mineral....J. A. Wendel
Filing-receptacle....G. M. Doner
Filtering-machine, Automatic....H. M. Leslie
Fire-alarm and thermo-indicator, Electric....A. H. McNeil
Fire-door construction....C. J. Caley
Fire-escape....G. E. Metter
Fire indicating system and extinguisher, Marine....W. Rich
Fireproof building construction....C. Collins
Fishing-reel....H. F. Crandall
Floor-cleaning machine....H. Askeli et al
Fluids under pressure, Apparatus for the production of hot....W. J. Cruyt

Flushing-tank....L. G. Leffer
Foot-guard....W. A. Harman
Foundry-flasks, Chaplet-anchoring device for....T. B. Harkins
Fruit-picker....M. Petzer
Fruit-picker's receptacle....C. W. Brewster
Furnace lid-lifting apparatus, Pit-....R. Rückels
Furnace method, Electric-....F. M. Becket
Furnace-tapping spout....C. C. Johnson
Furniture and the like, Joint for detachably connecting to one another the parts of wooden....C. Könckow et al
Garment-holding device....H. B. Wade
Garment-pattern....G. M. Laub
Garment-supporter....A. E. Gould
Gas-burner....H. R. Sheppard et al
Gas-engine, Turbine....V. G. Apple
Gas-main appliance....M. W. Offutt
Gas-producer charging device....H. Pettibone
Gases and apparatus therefor, Method of electrically detecting dangerous....H. Frcise
Gate....F. M. Botts
Gear, Change-speed....G. R. Willis
Gear for motor-vehicles, Transmission-....R. Huff
Gland-lock and swab....G. Christenson
Glass, Apparatus for manufacturing wire-....J. George et al
Glass-beveling machine....T. J. Corcoran
Glass-furnace....R. H. Miller
Glass-furnaces, Apparatus for drawing off small quantities of molten glass from....H. Severin
Glass-making machine, Wire-....J. George et al
Glass-molding machine....H. A. Schnelbach
Grader....M. M. Defrees
Grinding-machine....W. A. Bond
Gun-closure safety device....M. Hermsdorf
Gun hinge-pin, Breech-loading-....N. J. A. Fyrberg
Gun-sight....C. T. Foss
Gun sighting apparatus....O. Grauhering
Hame-fastener....G. Ericson
Hammer, Pneumatic....J. Frederick
Harrows and the like, Antitwisting draft means for....J. W. Rice et al
Harvester cutting apparatus....C. W. Carson
Hat-fastener....S. W. Bates
Hay and stock rack, Combined..C. W. Trigger
Head-block and tension-bar....H. W. Hock
Heat-distributing system....W. H. Pearce
Heating and ventilating system....P. Belvin
Hemostatic dressing, Preparing...A. W. Ball
Hemstitch-machine....M. Gould
Horse-detacher....D. L. Hunt
Horse-pad hook....E. L. McClain
Horse-tail holder....O. B. Read
Hose-clamp....H. C. Umpleby et al
Hot-water heater....L. E. Bixby et al
Ice-cream and the like package....G. J. L. Janes et al
Ice-cutting apparatus....F. B. Clark
Ice-cutting machine....H. F. Fischer et al
Index device, Card-....J. B. Mahoney
Ink-well, Self-closing....S. W. Emory
Insect Electric....W. H. Burns
Instep-support or arch-prop...L. T. J. Lubin
Incubator....W. C. Sandlin
Internal-combustion engine...M. Blieden et al
Jack, 2 pats....A. Searls
Jar-holder....A. W. Foster
Jointer....G. T. Wells
Kodak's shutter....L. Russell
Lamp-fastener....C. J. Traub
Kite, Dirigible....F. Riehl
Knitting-machine cam-adjusting mechanism....G. L. Ballard
Knobs and other metal articles, Machine for securing and scratch-brushing....D. F. Broderick
Lacing-hook....C. H. Upson
Lacings, Device for forming belt-....L. Vyne
Lacrosse-stick....D. Ceel
Ladder attachment....C. L. Thomas
Lamp, Electrical incandescent....O. M. Thowless
Lamp, Gas-....A. H. Humphrey
Lamp-lighting mechanism, Time..M. W. Lewis
Latch for movable lids....J. E. Wallace
Lathe, Driving-wheel....W. T. Sears
Leather, Recoloring....E. M. Robbins
Level....H. W. Brown
Level....R. S. Blair
Lid-holder....B. F. Coleman et al
Lifting-jack....W. L. Hardy
Load-binder....T. E. Calvert
Load-binder....I. Olson
Loading apparatus....P. Bissen
Lock....H. F. Keil
Lock....H. M. Small
Lock and latch....H. G. Voight
Lock-bolt....G. W. Wright
Log-peeling machine....J. Moravec
Looping-machines, Tbread-slackening device for....W. Payne
Lubricator....G. F. Godley
Lubricator with supplementary deliveries....J. N. Hochgesand
Mail-delivering apparatus, Automatic....C. U. Greeley
Manure-spreader....J. F. Rude et al
Massage appliance....A. Weintraud
Match-safe....E. O. H. Erickson
Mattress attachment....C. Uhden et al
Mattresses, Filling....F. Franke
Measure, funnel, and filter, Combined....P. M. MacKaskie
Measuring lumber, Recorder for....C. F. McLaughlin
Meat-cutter....H. J. Bridges
Mechanical movement....A. Wahle
Mechanical movement....B. Huber
Metals and their alloys, Improving the physical properties of....D. Lamon
Metals, Electrolytic process for the production of metallic dark coatings upon...A. Classen
Metals or alloys, Making low-carbon....F. M. Becket
Milking-machine....E. Hanson
Milking-machine....C. J. Muther
Mixer-opening device....F. B. Smith
Mixing-machine....J. A. Svenson
Moisture-proof eontainers, Making....A. Obici
Molding apparatus....P. Dupont
Molding bath-tubs and other large articles....P. Dupont
Molding large articles....P. Dupont
Monorailway system....W. D. Valentine
Motors, Vaporizer for internal-eombustion....F. Oberhänsli
Mower, Lawn-....H. O. Secrest
Mud-guns, Mounting for....A. J. Bryant
Multiple-expansion engine....A. G. Stokes
Musical instruments, Automatic pressure-regulator for pneumatic actions of....F. W. Draper
Musical instruments, Pneumatic for mechanical....A. G. Gulbransen
Mutograph....F. C. Newell
Nailing-machine....A. F. Preston (Reissue)
Necktie, Retainer-....C. W. T. Davies
Nest, Trap-....C. P. Walls
Newspaper holder and spreader...A. Lieberam
Nut and pipe wrench, 2 pats....D. Stewart
Nut-lock....E. M. Henry et al
Nut-lock....E. R. Hurd
Nut-lock....J. D. Woods et al
Nuts to bolts or studs, Means for locking....R. E. Davis
Oil feed or charge delivering device....J. E. Kimble
Oil-switch....E. M. Gerry
Ore-concentrator....F. G. Janney
Oven....E. A. Carpenter
Oven-feeding device....A. W. Copland
Packing-case, Sheet-metal....A. T. Kruse
Packing-machine....A. I. Hall
Paper-beater packing-box....J. E. Maurer
Paper receptacle....H. D. Thatcher
Paper-shell-making machine....J. Chesney
Paper tray....F. B. Davidson
Paring-knife....E. B. Gibford
Pencil-sharpener....T. Van Aller
Penholder....A. B. Moore
Petrolcum or distillate thereof to obtain an explosive mixture for internal-combustion engines, Treating cold crude....D. Martini
Petticoat....E. J. Segrell
Phonogram....B. F. Philpot et al
Piano, Automatic playing-....A. F. Larson et al
Pianos, Pneumatic action for automatic....W. J. Publow
Picture-frames and furniture, Means for ornamenting....H. Björnson
Pipe and post puller....S. F. Eubank
Pipe support and clamp, Combined..C. P. White
Pipe-wrench, Chain, 3 pats....G. Amborn
Piston connection, Flexible....H. Hess
Piston-heads, Ring-expander for..J. G. Morse
Planer, Crank-....H. E. and E. G. Eberhardt
Plow....T. B. Chappelear et al
Plow....A. L. Covey
Polishing device....D. S. Porter
Pool-ball rack....S. T. McGovney
Portable stand, Adjustable roller....W. R. Fox et al
Powder-distributer....C. D. Holt
Power-transmitter....E. T. McKaig
Precious metals from their ores, Extracting..J. Baxeres de Alzugaray
Printers' overlays and underlays, Preparing..E. Lankes et al
Printing-machine....S. Brown
Printing-machine paper-feeding device....S. Brown
Pulley....C. Gabel
Pulp or paper machine....G. M. Galt
Pump....G. Grussendorf
Pump, Deep-well cable-....H. C. Sillett
Pump, Hydraulic....D. J. Jarvis
Pump motor, centrifugal-....C. H. Jaeger
Pumping mechanism, Oil-well, 2 pats....D. R. Blakeslee
Pumping plant, Sand-....M. Swintek
Puncture-closer....J. H. Rand
Puncture-closures, Tool for setting..J. H. Rand
Rail cleaning and scraping device....A. J. R. Marjenhoff
Rail-fastener....A. Aretz
Rail-joint....S. Shuller
Rail-joint, Device for securing bond-wires to a....W. M. Post
Rail-splice....L. P. Schramm
Railway-joint....P. Stover
Railway signaling apparatus....M. W. Zabel
Railway signaling system....M. W. Zabel
Railway signaling system, Electric-..Y. Burgess
Railway-switch....W. Holquist
Railway-tie....C. G. Peterson
Railway-tie and fastening, Metallic....F. J. Slenker
Railway-tie construction....E. D. Bennett
Rake....F. P. Beedle
Razor, Safety-....J. C. Boyle
Razor-stropping device, Safety-..L. B. Gaylor
Razor-stropping machine....A. W. Scheuber
Recorders or reproducers, Diaphragm for....G. J. Anderson
Reflector for seareh lights....J. A. Rey
Regenerators, Construction of..A. Hermansen
Resonance curves, Apparatus for plotting....O. Scheller
Rock-drilling machine....W. Prellwitz
Rollers and other objects, Forming conically-shaped ends upon....H. Hess
Roofing, Metallic....W. M. Garvin
Roost, Poultry....J. E. McKinzie
Rotary engine....G. T. Killam et al
Rotary engine....R. Hofstetter
Rotary engine....A. W. Welsh et al
Rotary engine....W. L. Ellis et al
Rotary engine....G. W. Nütz
Rotary engine....G. W. Wood
Rotary engine....J. S. Hillyer
Rotary explosive-engine....G. L. Fairbrother
Rotary motor....R. E. Beaubien
Rubber for vulcanization, Preparing India-....H. Scholz
Rubber shoe....C. E. Mapes
Rule-holder....E. J. Espelin
Safe, Wall-....G. W. Anderson
Sander....J. H. Hanlon
Sanding device....T. T. Vest
Sandpapering-machine....J. L. Perry
Sandpapering-machine drum....J. L. Perry
Sash-lock....H. W. Covert
Savings-boxes, collecting-boxes, and the like, Means for preventing the unauthorized abstraction of the contents of..F. Hottmann
Sawing standing timber, Machine for....F. C. Schulz
Scraper....C. E. Smith
Scraper....L. M. Hildreth
Screen frame, Adjustable door or window....O. L. Carter
Screening-machine....R. P. Cunningham
Screw and forming maehines, Box-tool for....L. S. Brown
Screw-driver....W. K. Cozad
Screw-driving device....A. Raiche
Sealing deviee for air-tight vessels....W. G. Wilcox
Seed-hopper....O. W. Severson
Semivest and trousers....J. Bloch
Sewing-machine....H. N. Lee
Shade-fixture....B. F. Jordan
Shade-support, Adjustable....T. C. Howland
Shaft-holder....J. H. Jensen
Shank-stiffener....F. W. Leesburg
Sheave-header....G. Anderson
Sheet metal, Making expanded..F. A. Delano
Shell-extractor....D. E. Donati
Shelving, Adjustable....E. Allen
Shoe-finishing jack....G. H. Clark
Shoe-upper-supporting machine..L. J. Courteau
Shoes, Spring arch-support for..A. W. Walker
Shoes to soles of wood, &e., Machine for nailing the uppers of....C. Sattler
Show-case, Illuminated....L. Erikson
Siphon device for withdrawing liquids from vessels....A. W. Omond
Skate....J. King
Skylight....G. F. Drouvé
Sled-propeller....D. J. Shultz
Slicer....E. F. Smith
Sparking plug....E. Moonen et al
Speed and reversing mechanism, Variable-....W. J. and E. M. Steinle
Spike-extractor and jack....I. M. Coffey
Spinning, twisting, and like aparatus..H. Doll
Spool-holder....F. D. Osterhoudt
Spring structure....W. R. Smith
Square and drawing-board, T-....E. Werner
Stacker....D. Barney
Stall, Temporary cattle-....J. J. McHugh et al
Steam-generating apparatus....E. Thomson
Stilt, Adjustable....T. B. Garretson
Stocking finishing and stripping machine....P. F. Vogel
Stocker, Mechanical....J. A. Caldwell
Stool....F. P. Holtzman
Stoppers for stoppering bottles, &c., Machine for the manufacture of....J. Lowman
Stove, Heating-....T. F. Hatton
Street sweeper and cleaner, Combined....H. A. Huber
Suit-case....F. N. Bourne
Sulfur-spraying apparatus....D. E. Rosasco
Table-leg holder....E. Werner
Table lock, Pedestal-extension-...C. S. Burton
Talking-machine....L. T. Haile
Talking-machine stand and record-cabinet....L. F. Douglass
Tamping-machine, Tandem....G. Ross et al
Telephone-controlling device....N. Silverson
Telephone-lines, Disconnecting device for....F. Johnson et al
Thill-support....A. H. Chamberlain
Ticket holder and cutter, Cash-fare-....A. I. Blanchard
Tin, Machine for polishing, cleansing, and rolling sheets or plates of....D. Williams
Tire....A. O'Brien
Toilet-case, Pocket....J. B. Gamber
Tool-feeding mechanism....A. L. De Leeuw
Tool-stand....R. McCarty et al
Towel-rack....J. R. Lane
Toy....R. S. Fetter
Toy dump-cart....H. T. Kingsbury
Trains, Device for automatically stopping....G. W. Lancaster
Trains, Electrical device for automatically stopping....G. W. Lancaster
Trap-door attachment....J. Pishek
Trench-brace....C. P. Astrom
Trenching-tool....E. B. Cahoon
Trolley, Drop-....T. H. Mars
Trolley-ear....C. W. Eliot
Trolley guard and guide....C. Latsch
Trolley-wheel....R. P. Stark et al
Trolley-wheel....G. C. Bourdereaux
Truck and supporting-stand, Combined....C. Rawlinson
Truck, Disk....W. B. Christian
Trunk-lid brace....O. Rangnow
Trunk-strap....J. N. Gorman
Turbine....W. J. Cartwright
Turbine....W. E. Snow
Turbine....I. Lewthwaite
Turbine, Elastic-fluid....C. Pfenninger
Turbine, Reversible steam-....J. Procner
Twine, Grass....T. W. Jerrems
Twine machine, Grass....T. W. Jerrems
Type-bar cushion....C. Gabrielson et al
Type-writer attachment....R. D. Donoho
Type-writer key-lock....W. D. Fricks
Type-writing machine....H. W. Merritt
Type-writing machine, Tabulating attachment....H. K. Henry
Undergarment....C. H. Little
Valve....I. K. Beaver
Valve, Combination air and gas mixing....A. W. Hartje
Valve, Hydraulic....C. L. Taylor
Valve mechanism....G. S. Bowes
Valve-motion for direct-acting engines, Tappet....D. J. O'Rourke
Valve, Slide-....M. J. Maloney
Valve, Starting-....A. Stewart et al
Valve, Triple....E. C. Washburn
Vapor-generating apparatus....E. Thomson
Vehicle....C. A. Smith
Vehicle....E. R. Hewitt
Vehicle....C. A. Smith
Vehicle-brake....O. S. Lee
Vehicle shock-absorber....J. J. Jennings
Vehicle-spring....F. G. Fletcher et al
Vehicle-wheel....J. McIntyre
Vehicle-wheel....J. Nicholson
Vehicle-wheel, Resilient....C. A. Conroe
Vehicles, Means for regulating the temperature in....T. C. X. A. Berget
Veil-pin....F. A. Curry
Vending-machine....J. Fritsche
Vending-machine....I. H. Garson
Ventilator....L. S. Wiemann
Vibrator, Electrical....M. K. Golden
Voting-machines, Independent-vote mechanism for....S. Loe
Vulcanizer....W. H. Barnard
Wagon-brake....W. C. Moors
Wagon, Dump-....D. Stafford
Waistcoat....M. M. Henderson
Washbasin....T. C. Colton
Washing-maehines, Mechanical movement for....W. H. Voss
Washing or scouring-machine...F. L. Furbush
Watch-movements, Ring-band for....C. Funk
Water from mineral, vegetable, and animal substances, Separating and simultaneously extracting....B. Schwerin
Wheel....E. Staneliff
Whip-lock....H. C. Laudermilch
Window and balance, Sash....J. Nerén
Window-ventilator....H. A. Dirkes
Wirecalk, Removable....G. S. Meyer
Wire-clamp....N. V. Hosack
Wire-screen-cloth rack....C. E. Bennet
Wood, Vulcanizing and coloring...W. A. Hall
Wooden structure....D. F. Daley
Wrench....W. C. Barnes
Wrench....F. M. Damon
Wrench-handle....F. Searle
Writing-machine....F. F. Main

DESIGNS.

Bottle....F. J. Probst
Brushes, mirrors, or similar artieles, Back for....S. A. Keller
Brushes, mirrors, or similar articles, Back for....H. J. Straker
Chair....L. Killian
Emblem....B. T. Capen
Hat, Child's....S. G. Hirschberg
Lamp, Gas-....A. Reetor
Rug....A. Petzold
Spoons, forks, or similar articles, Handle of....W. C. Codman
Stove, Heating-....J. P. Ouerbacker

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MECHANICAL PATENTS.

Absorbing composition and making same....J. F. May
Acetylene-generator....G. Roceo
Acid, Producing concentrated nitric....B. F. Halvorsen
Adjustable stand....M. W. Hearn
Adjusting and locking device...F. H. Richards
Advertising device....F. X. Robert
Aerial navigation....C. A. Moore et al
Air-brake-pressure adjuster, Automatic....U. S. Smith
Air-compressor, Hydraulic....C. H. Taylor
Air-sander....W. Hughes
Amalgam for use in coating glass to form mirrors....J. Laval
Amusement device, Trick....F. I. Judson
Atomizer and powder-distributer, Combined....W. J. Barber
Automobiles and the like, Cooler for....J. D. Maxwell
Automobiles, Electric-lighting system for....F. L. Parrill
Automobiles, Glass front for....J. Wieden
Automobiles, Radiator for..A. L. F. Holzerland
Axle....R. V. Lee
Back-spacing device....J. W. Paul
Bag-lock....R. Masters
Bars, Work-board for....E. B. Hogan
Bath-tub seat....J. P. Elustis
Battery-charging apparatus....F. G. Duryee
Battery-indicator....R. N. Chamberlain
Bearing, Roller-....H. B. Gillette et al
Bearing, Roller-....E. L. Sharpneck
Bearing, Roller-....E. Moonen
Bed with commode attachment, Invalid-....W. C. Feely
Beer and like liquids, Apparatus for cooling....H. G. Miller
Belt, Metallic....H. L. Canne
Belt-stretcher....R. I. Henderson
Bicycle-crank....A. Cataldo
Bin....W. C. and F. W. Hobbs
Blackboard for partitions....H. J. Hanson
Blacking machine, Heel-....O. J. Lear
Blankets, Attachment for stable-...C. A. Noble
Boats, Hand-operated mechanism for row-....S. G. Hallman
Boiler-cleaner....O. S. and L. A. Platt
Boiler-feed-pipe cleaner....J. H. Watters
Bolting-cloth cleaner....J. P. Guidinger
Book tooling and lettering press....M. Kalaba
Boots and shoes, Means for attaching pads to....W. Plowright
Boots and shoes or the like, Mechanical hammering device for use in the manufacture of....G. Kron. (Reissue.)
Boring-tool holder, Adjustable...W. J. Roman
Bottle and jar stopper....C. E. R. Christensen
Bottle-filling machine....L. P. Williams et al
Bottle, Non-refillable....C. B. Davis
Bottle receiving and handling device....T. F. Lamb
Box-fastener....H. A. Voelkner
Bracelet....S. B. Kent. (Reissue.)
Brake-shoe....C. D. Pettis
Brick-molding machine....H. S. Bowler
Brooder....H. H. Charles
Brooder-heating appliance....R. F. Brooks
Broom-support....L. Jorgensen
Brush....F. D. Wolfgram
Bucket-dump, Automatic....N. J. Sweeney
Buckle....R. London
Buckle....W. F. Aston
Buckle....W. Lebowitz
Buckle attachment, Belt-....A. A. Felix
Button-fastener....F. E. Warner
Cake-cutting guide and gage....F. Rexer
Calculating-machine....T. Bäuerle
Calculator, Interest-....M. Katz
Camera, Magazine-....W. C. Seekler
Can-cap-hemming machine....L. C. Krummel et al
Canning apparatus....W. W. Wilson
Car, Convertible....B. Mazanek
Car or train safety apparatus...J. P. Coleman
Cars and other vehicles, Spring-wheel for motor-....E. Rodriguez
Cars or vehicles along a railway, Apparatus for governing the passage of....J. D. Taylor
Carbureter....E. N. Broderiek
Carbureter....G. H. Holgate
Card-shuffling device....B. F. Bellows
Card-support....W. L. Keplinger
Carpenter's gage....B. A. Vaughn
Carriage foot-brake....C. Strohkorb
Carry-all....S. D. Wilson
Cartridge safety-cover....F. C. Mosier
Carving-machine....M. A. Cuming. (Reissue.)
Celluloid-like substanee....C. Schraube et al

Cement-block machine.....W. S. Colvin
Centrifugal separator.....E. A. Forsberg
Chain.....J. Sevcik
Check-bit, Safety.....C. H. Lawton
Check-row attachment.....W. B. Hampton
Chin-support.....C. J. Lewis
Chute, Conveyer-.....J. Ream
Cigarette-holder.....O. A. Day
Circuit-closer, Time-limit.....W. W. Brown
Cleaning and polishing machine.....
.....R. G. Carpenter
Clevis.....J. H. Wiese et al
Clevis.....R. H. Sullivan
Closure.....P. J. Sweeney
Cloth-cutting machine.....A. Spielman
Clutch.....T. G. Morse
Coal-screen.....F. S. Converse
Cock, Automatic supply-.....F. B. Easton
Coffee percolator and strainer....R. Jorgensen
Coin-package wrapper.....R. B. Ware
Coin-parceling apparatus.....W. C. Olland
Collar, Horse-.....J. H. Crouse
Collar-shaping device.....J. J. Meehan
Collar-supporter.....N. Illoway
Concrete buildings, Apparatus for use in construction of.....N. C. Newerf
Concrete-mixer.....J. Carlen
Concrete mixer and conveyer.....J. B. Thies
Concrete-mixing apparatus.....A. G. Axelson
Concrete post, Reinforced.....I. L. Graham
Control system.....H. D. James
Controller.....E. W. Stull
Cooking utensil.....A. T. Lueckenbach
Cork-extractor.....C. J. Gromer
Corsets, Abdominal strap for apparel-.....
.....S. Kops
Cotton-handling apparatus.....A. A. Sullivan
Couch.....S. E. Condon
Coupling-gage.....G. E. Starbird
Crane-hook attachment.....E. O. Davis et al
Cream-separator, Centrifugal..P. T. Sundberg
Cross-tie and rail-fastener, Metallic.....
.....G. Williams
Cultivator, Lister-.....E. M. Swanson
Cultivators, Chopper attachment for.....
.....C. A. Snider
Curtain-fastener.....F. Harggraff
Cutter-bar.....J. W. Chesrown
Decoy-support.....H. A. Kricke
Desk.....V. Kilpatrick
Diabolo-bobbin.....D. D. Field
Dispensing-can.....S. Ellery
Display-rack.....W. Freeman
Distribution system....H. L. Van Valkenburg
Ditching-machines, Conveyer for...A. J. Koob
Door fastening, Sliding.....J. J. Wells
Door-securer.....C. W. Stewart
Doors of dumb-waiters, Locking device for the well-.....A. E. Fischer
Downdraft-furnace.....O. D. Orvis
Draft appliance.....D. S. Jenkins
Drilling-machine.....M. E. Spears
Drilling-machine.....J. P. Karns
Driving-gear.....W. A. Buettner et al
Driving mechanism.....G. W. Morris
Drums and the like, Skin substitute for heads of.....C. Poland
Drying-machine, Rotary.....W. M. Schwartz
Dust-absorbing compound.....F. D. Wolfgram
Dye and making same, Yellow sulfur.....
.....W. Schmidt
Dye, Red vat.....K. Schirmacher et al
Dyeing.....H. Toepfer. (Reissue.)
Dyeing and bleaching apparatus.....
.....J. Schmitt et al
Educational device.....J. A. De Vilbiss
Egg-beater.....E. W. Ladd
Egg-tester.....J. W. Billings
Electric battery.....W. Morrison
Electric snap-switch.....W. S. Mayer
Electric switch.....H. H. McIntire
Electric wires, Swivel-joint for....H. A. Black
Electrical connection-plug.....W. S. Mayer
Electrotherapeutic generator.....S. N. Metzler
Embalming liquid, Concentrated...C. B. Dolge
Embroidery-hoop.....F. E. Kohler
End-gate fastener.....M. R. Cole
Engine.....L. S. Burbank
Engine-starter.....G. L. Odenbrett
Engine-starting device, Explosive-.....
.....L. S. Nash
Envelop.....C. S. Northrop
Envelop.....D. and G. La Tremouille
Equalizing device.....A. Lawson
Excavating-machine.....W. N. Morrill
Excavator.....C. G. Rollenhagen
Excavator.....J. G. Fairbanks
Excavators, Chain-drive for.....C. H. Caleson
Explosive-engine.....C. H. Baldwin
Explosive-engine, Compound....J. A. Williams
Fabrics, Fringed edging for....M. O. Rehfuss
Facial defects, Appliance for removing.....
.....M. B. Smith
Fan.....J. C. Morgan
Fan, Distributing-.....L. E. Roby et al
Fare-register.....J. F. Ohmer
Fashion-plate frame and display-stand for merchandise, Combination.....A. K. Brauer
Fastening device.....A. V. Bryce
Faucet.....G. F. Barron
Felly-joint.....J. A. Cain
Fence-post attachment.....L. B. Harmon
File.....F. C. Hayes
Filter.....G. Knock
Filtering-well.....G. Chenot
Firearm, Repeating..L. L. Hepburn. (Reissue.)
Fish-hook releaser.....O. F. Immell
Flashing apparatus, Sign-.....G. Wesley
Flexible joint.....M. W. Brown
Floor-dressing machine.....E. W. Whitmore
Foot appliance.....E. S. Farra
Foot support and protector.....F. Dahlmann
Fruit and vegetable pitter.....D. H. Mosteller
Fruit-juice and preserving same.....
.....J. A. Froberg
Fruit-packing box.....A. L. Woodill
Frying-pan.....L. I. Toothaker
Furnace-cover-operating mechanism, Pit-.....
.....D. L. Mekeel
Furnace draft-regulator, Boiler-.....G. Steele
Furnaces, Radiator for hot-air.....F. Kernan
Furniture, Apartment wall.....C. R. Jordan
Furs, Fastener for.....A. Klein
Gambrel, Hog-.....J. A. Gratton
Game-board.....J. Massoth
Gape-worm extractor.....S. M. Walker
Garbage plant.....T. W. Draine et al
Garment-holder.....C. J. Malings
Garment-hook.....E. W. Ladd
Garment-stretcher.....F. X. Faller
Gas analysis, Apparatus for....C. A. Hartung
Gas, Apparatus for manufacturing water-.....
.....P. Plantinga
Gas-fixture, Extensible.....L. R. Yansky
Gas generator, Acetylene-.....C. W. Beck
Gas generator, Acetylene-.....C. E. Wry et al
Gas-producer.....W. B. Hughes
Gas-producers, Ash-extractor for.....
.....J. A. Smitmans
Gate and door fastening device...S. B. Scholz
Gear-cutting apparatus.....J. F. A. Mill
Gear-cutting machine.....N. A. Christensen
Gear, Speed-changing.....C. H. Lee
Gear, Transmission-.....F. E. Landberg
Gearing.....T. J. Winans
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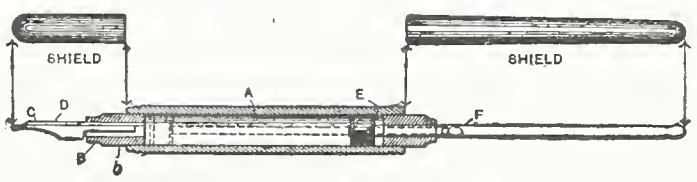
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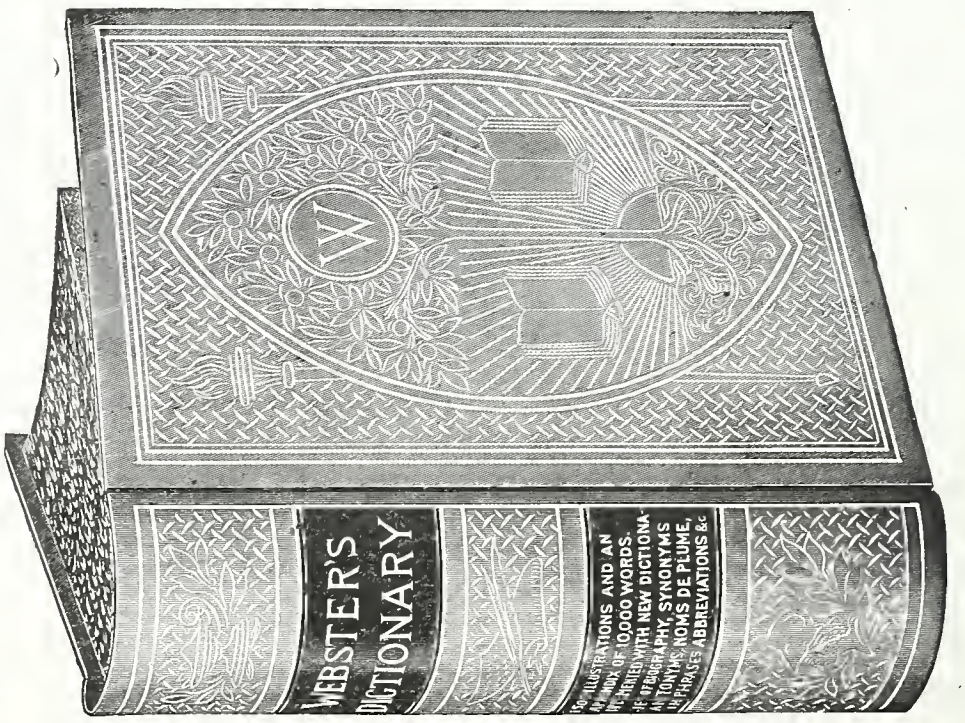


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DREDGING FOR GOLD.

By FRANK C. PERKINS.

MAN has enlisted the aid of electricity and of the centrifugal turbine pump in his search for gold. The precious metal is dug from alluvial soil with bucket dredge machinery, and no better method has been found than the up-to-date gold dredge with its turbine pump equipment. The electric dredge is extensively employed in the gold regions of Idaho, Oregon, and California, and the method of operation of these modern mining devices is shown in the accompanying illustrations.

One dredge in use in California, has a capacity of 3,000 cubic yards per day, digging 35 feet below the water line. It stacks 30 feet above the water line, and is provided with buckets holding 7 cubic feet. This dredge is thirty-four feet wide, and its hull has a total length of ninety-four feet. A 10-horse power electric motor is used for driving the screen, and a 75-horse power motor operates the main bucket line, while the ladder winch is operated by a 20-horse power motor. The ladder and buckets weigh 45 tons and the steel gantry over 50,000 pounds. The electrically driven winch is so arranged that each drum is entirely independent and can be operated regardless of the others, whether driven loose or held, and it is maintained that this prevents delay in moving the dredge from one position to another, increasing the output of the dredge fully one-third.



YUEKA GOLD DREDGE.



MODERN ELECTRIC GOLD DREDGE.

The electric motors are of three-phase type and operate at a pressure of 450 volts. The main bucket line uses about 40-horse power in driving the chain of gears, when dumping at the rate of a dozen buckets per minute. A steel delivery plate passes the material as it drops into the revolving screen, two streams of water being employed for washing the buckets after they are dumped. The revolving screen is 30 feet long and 4½ feet in diameter, perforated with ⅜ inch holes. The upper end of the screen also carries steel treads, which revolve on cast steel rollers, running in cast iron chairs bolted to the main steel gantry. The motor is located above the screen and is thus removed from dirt and water, driving the screen by a set of cast steel gearing and belt transmission.

The coarse material is delivered by the revolving screen to the stacker buckets carried on manganese steel rollers. and renewable steel corners are provided both on the top and bottom tumblers, which are of cast steel. Another 10-horse power electric motor is utilized for driving the top tumbler, located at the upper end of the elevator above the line of buckets, the transmission being accomplished by means of cast steel gearing and belting, thus doing away with a long rope drive.

Electric power is further used on this dredge for supplying the necessary water, a double centrifugal pump being utilized, directly coupled to a motor of 50-horse power capacity. This high pressure pump supplies water to the revolving screen, and for the distributing box a low pressure pump is employed. It is stated that the pressure of the water in the screen pipe is higher than in the pipe supplying water to the distributing box, so that two pumps are necessary for this service. After the fine material has passed through the perforated screen and fallen on the distributing plate, it is carried to the gold saving tables which are fitted with matting and expanded metal, a mercury trough being provided between each of the two lengths of the table. The material from the tables passes into sluice ways

which have angle iron ripples. It is stated that about 100 horse power is required for operating this dredge, when operating at its normal capacity of 300 cubic yards per day, and that the daily expense is about $100. A crew of only two men per shift is required on account of the special saving devices employed.

The introduction of gold dredges into the United States on a commercial scale dates from 1895. In that year a small electrically operated dredge was installed at Grasshopper Creek, at Bannock, Montana. This dredge was the precursor of several others in the same locality, all of which did well and made money for their owners. These early dredges represented the combination of a dredging apparatus with a hydraulic sluice box, and in both these elements the original separate forms were adhered to. The dredge was of a type which has been successfully used for river and channel dredgings, and the sluice box was that long employed by miners in hydraulic mining. A type was thus established, which, improved in detail, has since been largely introduced. The elevator type of dredge was soon recognized as the best adapted for gold dredging, and the history of many experiments with other types is one of failures. Subsequently the New Zealand type of dredge was introduced. This differed from the American type in having mooring lines instead of spuds, and a screen and table covered with fine riffles or fibre for saving the gold, instead of a sluice box. In New Zealand, however, the gold is fine and the ground comparatively soft or alluvial, and the early dredges were found to be too light for the harder service of this country. Then followed a period in which the two types of dredge, American and New Zealand, were strengthened and improved by their respective makers until some recent examples show such great size and weight of parts that the cost is greatly increased. That the durability and cost of repairs is still far from satisfactory in the average dredge is shown in the report of the state mineralogist of California for 1905, from which it appears that the cost of repairs frequently amounts to 50 per cent of the whole operating cost.

In the dredges now in use, all the best features of both New Zealand and American practice have been retained, and complications and weight reduced as far as possible by correct design and the use of high grade steels, with as little cast iron as possible. The result is a machine that is strong, light, easily handled, and economical to transport and erect, and that can be depended on to do its work continuously with slight repairs.

It is said that the increasing use of the dredge for working low lying and low grade alluvial ground has opened up a wide field for this class of mining. Formerly, ground that would not pay over 25 cents a cubic yard was not considered profitable, and this is probably still true in the far North and in localities where freight, fuel and labor are expensive. But under ordinary conditions, ground which was formerly thought worthless can now be worked at a profit. With proper business prudence and thorough prospecting, gold dredging has become a manufacturing proposition, with all the proverbial uncertainties of mining eliminated.

WIRELESS TELEPHONE IN THE U. S. NAVY.

So much interest has been taken in the wireless telephone system with which the Pacific fleet is equipped, that a brief description is given herewith. The De Forest system is the one used, experiments along this line during target practice having proved the possibility of telephonic intercommunication between vessels up to a distance of twenty-two miles.

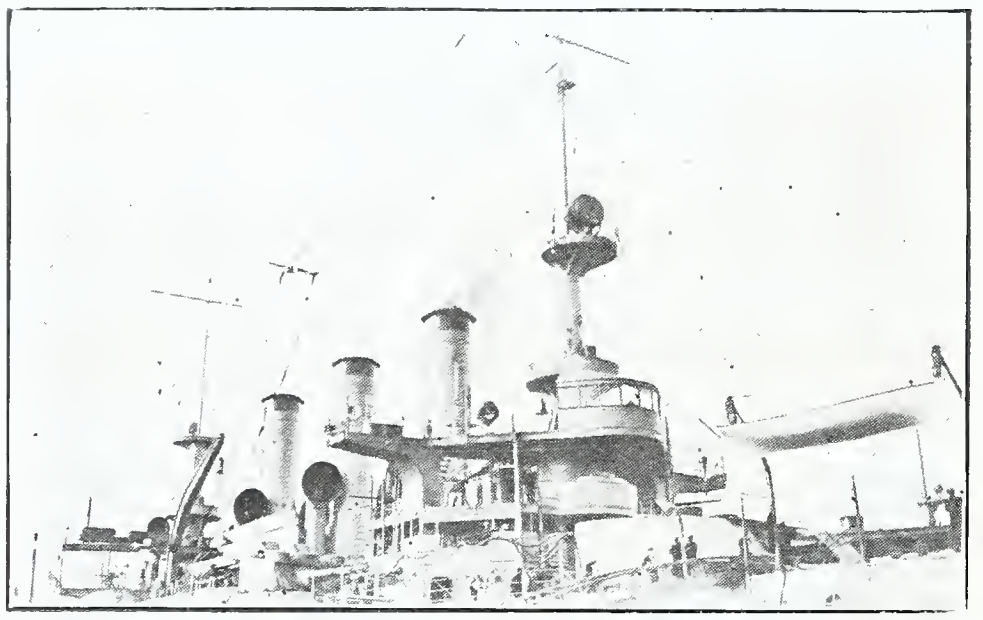


FIG. 1.—RADIO-TELEPHONE ANTENNAE ON THE U. S. S. CONNECTICUT.

One of the most important parts of this apparatus is the audion, a sensitive device which takes the place of the coherer, electrolytic detector, or magnetic detector of the wireless telegraph system. It has the appearance of a small incandescent lamp, with a plate and a grid of platinum sealed into the bulb, and a filament of tantalum which glows from the action of a storage battery current. A current of 220 volts from the battleship's electric lighting plant is conducted to the transmitting instrument, flowing through choke coils, the latter preventing high frequency alternating currents from passing. The current is then conducted to the oscilator, an arc, maintained in the flame of an alcohol lamp, being used for this purpose.

The De Forest Radio-Telephone, like wireless telegraphy, depends for its action upon the production of electric waves which travel through the atmosphere at about one-sixth of a million miles per second. The interruption, however, is entirely different.

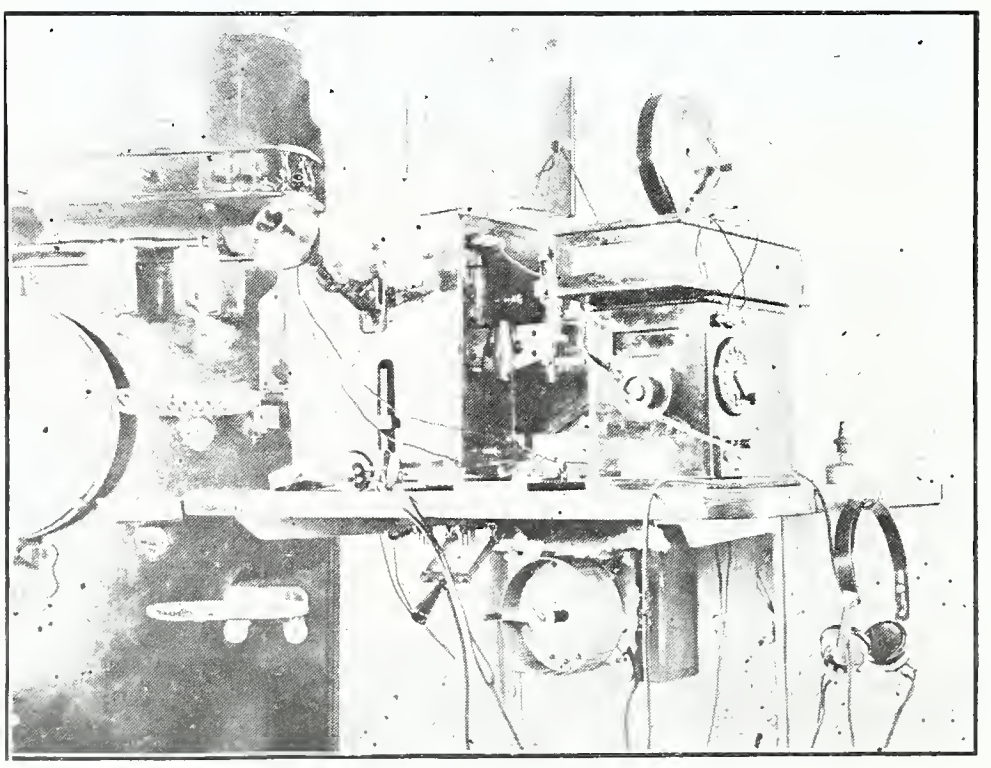


FIG. 2.—WIRELESS TELEPHONE APPARATUS.

It is essential that currents of high frequency pass through the primary of the transformer, a frequency of 40,000 per second in this apparatus being used, and a condenser being interposed in the circuit. The human voice has vibrations varying from 500 in some tones up to 20,000 per second for others. In wireless telegraphy a few interruptions per second only is essential The secondary of the transformer of the radio-telephone transmitter is connected with the aerial conductors or antennae, and waves of the proper frequency may be sent out into the atmosphere by arranging the two circuits and adjusting them to produce the required aerial wire oscillations. The resistance in the carbon granules of the microphone transmitter varies with vibrations of the voice, and this affects the intensity or amplitude of the waves transmitted by the antennae into the air. In wireless telephony the variations are what produce the desired results, while in wireless telegraphy they are cut off entirely, and in this way produce the Morse signals.

The Radio Telephone receiving instrument is connected to a similar aerial wire and to a transformer which has one end of its coil connected to earth. There are two condensers in the secondary of the transformer, the audion being also connected in the secondary circuit with a separate storage battery, together with a telephone receiver, with another battery for this local telephone circuit. A series of oscillations are set up as the electric waves impinge upon the antennae, affecting the audion through the circuit of the transformer. It is stated that the resistance of the gas ionized by the heat of the glowing lamp filament is varied by the changing amplitude of the oscillations in the aerial wires. The diaphragm of the receiving telephone is thus caused to vibrate, reproducing exactly the sound which the transmitter received.

Theaccompanying illustrations show the electrical apparatus used for wireless telephone service on the U. S. S. Connecticut and Virginia.

The transmitter is shown at the left, (Fig. 2.) and the oscillator at the right side, the alcohol lamp being shown under the nickle plated casing. There is a small handle moving in the slot at the side of the box which is used in tuning the transmitting circuit, and a listening key is provided in order to connect either the transmitting or receiving instruments to the aerial wire when desired.

A chopper consisting of a telegrahic key and a box similar to a buzzer is arranged in such a manner that wireless telegraph messages may be sent by Morse signals, by throwing the proper switch.

The system has worked so well, and been so useful during the long voyage of the Pacific fleet, that wireless telephones may be regarded as permanent accessories to the navies of the future. It is stated that naval attaches of several foreign governments are negotiating for equipments similar to those in service on the United States fleet.

Gum Arabic.

Gum arabic, which is used for the dressing of wash goods, also in the candy and other trades, is really the sap from a tree that grows in the Soudan. The sap runs from December to May, and before gathering it, the natives cut the bark in numerous places. The sap exudes and solidfies into lumps, which are gathered by hand. There are two main classes of gum—the amber and the bleached. the latter has been exposed to the action of the sun, amber being its natural color. Gum arabic is one of the most important of the minor exports of Egypt.

Making Liquid Air.

The expense of manufacture has been the great drawback in the industrial use of liquid air. A refrigerator plant in Kansas City, however, is distributing a lower temperature to such plants as want to make commercial utilization of it. A pipe line a mile long extends through the business part of the city, connected with two 175-ton ammonia compression refrigerating machines. Three pipes are used in the system—one to carry the liquid ammonia to the refrigerators, a second to carry it back in the form of a vapor, and a third, not in constant use, to pump out the private storage rooms and refrigerators when it is desired to make repairs.

The ammonia is carried through the pipes under the streets into the refrigerators and there passes through a series of coils, drawing the heat from the refrigerators and itself becoming a vapor, in which form it goes back to the distributing point and is condensed to be used again.

As ammonia is difficult to handle, and every precaution is necessary, all the pipes are joined by recessed hydraulic couplings lubricated with graphite and oil. After being thoroughly tested with ammonia, each joint is sealed with slip glands and rubber rings. To provide against strain and buckling, they are placed on roller carriers spaced 15 feet apart, while the liquid and pump-out lines travel back and forth in a cast iron iron yoke clamped to the vapor line. There are manholes at every street intersection, lateral pipes being run along the curb from each manhole and tapped to furnish service to customers. It has been found possible, by the apparatus described, to furnish refrigeration at a cost equal to ice at 15 to 20 cents per 100 pounds.

Tree Dentistry.

Hardly a day passes that a new use for Portland cement is not found. One of the leading railroads has replaced wooden telegraph poles by concrete ones, and they are found more satisfactory from almost every point of view. Reinforced concrete planks are being used in steamboat construction. Wooden ties are being replaced by concrete. The infant's milk is obtained in a dairy where the floors, walls, bins, and stalls are all of concrete. As he grows older he is surrounded on all sides by concrete structures, and when he dies his body is placed in a grave whose vault is constructed of concrete, and a concrete tombstone is used to mark his resting place. Thus the examples of the varied uses of concrete might be multiplied. One of the most novel, however, is the employment of cement for tree dentistry, which consists in filling old cavaties in the trunks of trees with a rich cement mortar, after the rotten wood has been carefully removed, somewhat similar to the manner in which a dentist cleans a tooth cavity. Foresters believe this will be the means of saving many old trees from further decay.

A MAGIC HOUSE.

By E. Ommelange.

At Troyes, a town near Paris, there exists a remarkable house, where everything is done by electricity. If the principles upon which it is built were generally adopted, there would no longer be any use for the servant class as it exists today, for all domestic work would be carried out automatically by electricity.

Descriptions of this curious residence have already appeared in the Inventive Age. (See issue for Dec. 1907, for the most recent.) Since the apparatus is unique, however, further details and illustrations are given.

The following is an acount of a visit made by a reporter to Mr. Georgia Knap, the proprietor of the house.

"When I pressed an electric knob at the iron gate-way, a mysterious voice, which apparently came from the wall, asked the purpose of the visit. After explanation, the gate opened automatically and the voice invited me to enter. As I passed the threshold of the house I looked down, and saw that a rapidly-moving mass of bristles under a grating was obligingly wiping my boots. Mr. Knap, after having welcomed me, conducted me over the house, beginning with his bed room. When it is time to get up in the morning, he presses a knob on a little table, and without moving from the bed, orders his breakfast. Presently the top of a table on the right of the bed unfolds, an aperture in the wall opens, and there appears a breakfast tray, with Mr. Knap's coffee and his letters. The tray has travelled by an electric lift from the kitchen. From the bedroom, we proceeded to the dining-room.

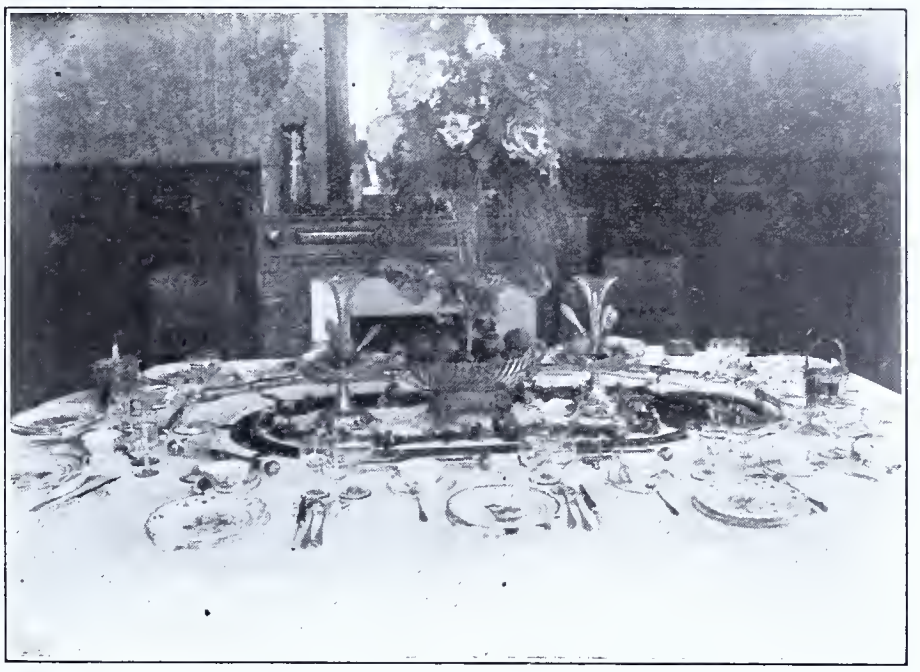


FIG. 1.—TABLE READY FOR DINNER.

The table is provided with a movable electric section, on which the food is placed in the kitchen below, and which rises when the guests are seated. The section (see Fig. 1.) revolves, running on a groove, and stopping in front of each guest until he has helped himself. By this means the host declared, he has served an eight course dinner, without a servant entering the room. After each course, a small plate wagon travels around the groove and collects all the dirty plates and knives and forks. It takes just one minute to clean the table and put on a new course.



FIG. 2.—ELECTRIC KITCHEN.

After the dining-room, we visited the kitchen. In one corner, on a table, a mayonnaise sauce was being mixed, beef was being chopped, and butter was being churned. No human hand touched any of them. All three operations were being carried out by electricity, and when they were complete, the current stopped automatically. Fig. 2. shows some of the apparatus in the electric kitchen.

The owner can easily carry on a conversation from any room with those in the basement. It is really a case of walls having ears. He can hear every whisper in the house, and, in order to prevent embarrassing complications, he has only to turn a switch to prevent others hearing what is going on in any particular room.

Mr. Knap has also installed what he calls his Electric Sun. This he turns on in the garden, after the sun has set. Its rays light up the place as though it were midday, and the heat it diffused was so great, on this occasion, that two ladies present were obliged to put up their umbrellas. The inventor asserted that with this artificial sun, he could produce summer flowers and tropical growths in winter.

Mr. Knap has spent $40,000 in experiments on his house, which during the last few months has been visited by over a thousand architects and electrical engineers from all parts of Europe.

Largest Vault in the World.

The largest vault in the world is in New York, and is made of armor plate. It belongs to the Carnegie Safe Deposit Company, and is made in two stories, with an elevator running between them. The lower chamber is 9½ feet high, 106 feet long, and 30 feet wide. The weight of the whole is 1200 tons. Four-inch armor plate, such as is employed on battleships, is used in making the plates of the great vault, and these are dovetailed together so that they cannot be separated from the outside. Concrete 16 inches thick covers the whole of the safe. The three doors are regulated by clocks in their opening, each door having four clocks. When the doors have been closed, only these time pieces can open them, as each clock is set at night for the hour next day when the vault is to be opened. When that hour comes, by automatic action the bolts of the doors are thrown back and the officials can enter.

Riches of the Sea.

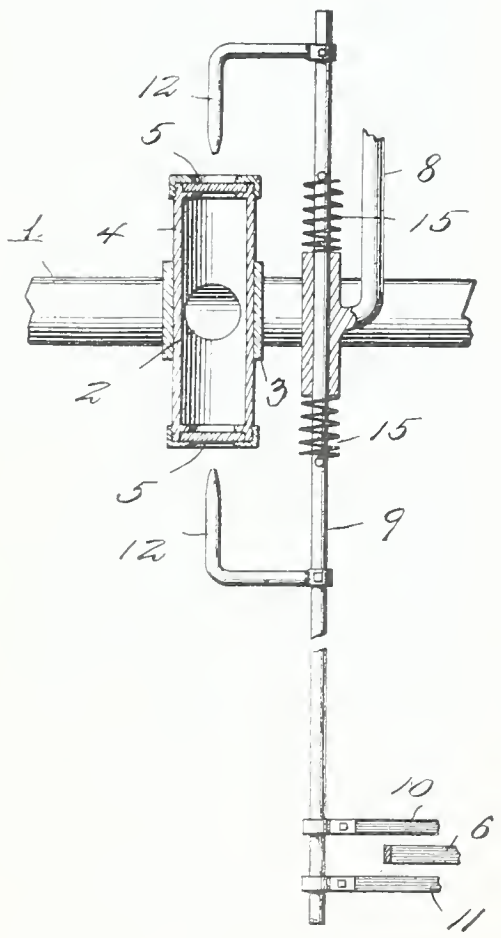
Fortunes lie in a scientific exploitation of the waters of the sea, for they contain not only gold in quantities beyond the dreams of avarice, but other valuable minerals as well. But all of these will not equal in importance to mankind the two gases, oxygen and hydrogen, of which water is composed. Scientists foresee the time when liquefied oxygen will be our only disinfectant and bleaching agent: just as hydrogen, which furnishes the greatest heat terrestrially known, will be our fuel. It will not matter much, then, that our coal fields become worn out, for we shall be able, so to speak, to start burning our oceans, and these are in this respect inexhaustible.

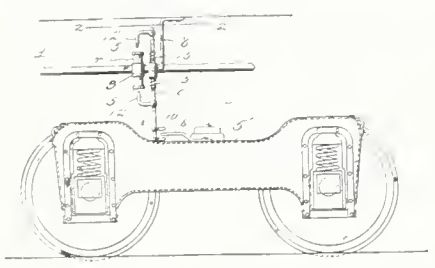
CLEVER NEW PATENTS.

Safety Attachment for Car Trucks.—Hoof Trimmer or Nipper.—Rotary Engine.—Boring Tool.

Safety Attachment for Car Trucks.

A novel safety attachment for car trucks is the subject-matter of a patent granted to John B. Wright, of Greensboro, North Carolina, and has for its principal object to provide means whereby on an abnormal movement of the truck, such as in the event of the wheel leaving the rail or the breakage of connection between the truck and the car, the air brakes of the train will be instantly applied. In the accompanying illustrations, the train pipe 1 is provided with a branch pipe 2 that is connected to a T, 3, and to the end of the T are coupled short pipe sections 4, the ends of which are closed by caps 5 formed of glass, hard rubber, or any other frangible imporous material. Furthermore these caps are hermetically sealed in the ends of

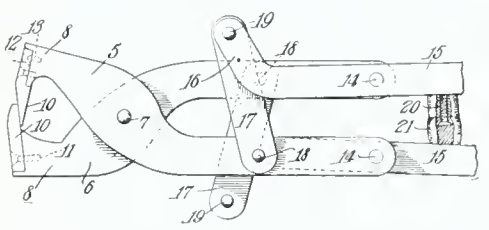




these sections so as to positively prevent the accidental leakage of air from the train pipe. To the bolster or bar 5 of the truck are secured bars 6. The car is provided with a hanger 8 forming a guide for the vertically movable bar 9, said bar having a pair of horizontally disposed arms 10 and 11 at either side of the bar 6, so as to permit of considerable movement of the bar before coming in contact with the bar 6. The vertical bar 9 also carries a pair of fingers 12 arranged in alinement with the frangible caps 5 but normally out of contact therewith. Thus it will be readily seen that should there be any abnormal movement of the truck, the arm 11 will be brought into contact with the truck, and raised a certain distance. Thus as the arm 9 is raised, the finger 12 will be brought into engagement with and breaking one of the caps, will thereby allow the air to escape from the train pipe, which will immediately apply the brakes in the usual manner.

Hoof Trimmer or Nipper.

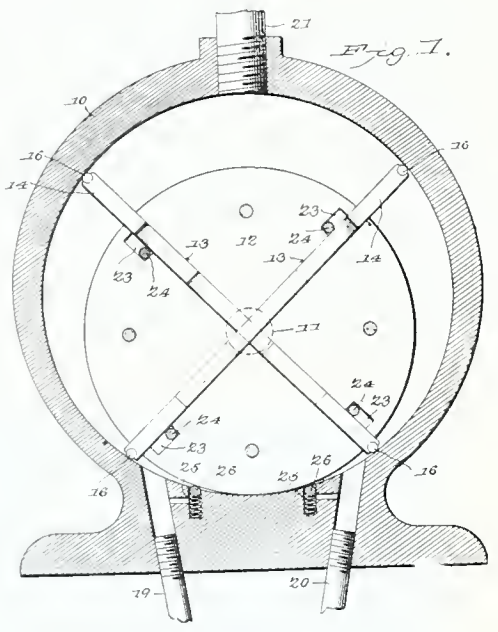
This is a device that every blacksmith should have. The construction is simple and inexpensive, and the arrangement of the parts is such as to materially increase the leverage and thus render the tool more efficient in



operation. The implement comprises co-acting members 5, and 6, pivoted together at the point 7, and each provided with a jaw furnished with cutting blades. The blades 10 are secured in position by means of screws. There is an ingenious arrangement by which the angle or inclination of one of the blades may be varied at will. The operating levers 15 are provided with angular extensions 16 connected by means of links 17 to the co-acting members. By this construction, when inward pressure is exerted on the levers 15, the shanks 5 and 6 will be brought together, while the extensions 16 of the levers will be forced laterally in the arc of a circle, thus causing the links 17 to exert an additional pull on the jaws, so as to force the blades in contact with each other. A screw or similar fastening device is employed to hold a block of rubber to one of the operating levers, so as to form a stop and at the same time a buffer. This construction provides a tool that possesses points of utility, durability, and efficiency over anything on the market. The patent was taken out by Jerry D. De Celle, of Fort Collins, Colo.

Rotary Engine.

Theophilus W. Moore, of Leesburg, Fla., has been granted letters patent for an improved rotary engine, in which a revoluble piston drum is arranged within a cylinder and is provided with diametrically movable piston wings of such construction that the opposite ends of each wing will at all times be in engagement with the inner curved wall of the cylinder. By reference to the accompanying illustration, it will be seen that the cylinder 10 is provided with opposite heads having bearing openings for the passage of a shaft member 11, and on said shaft is secured a cylindrical piston drum 12 that is disposed eccentrically with respect to the cylinder, and at one point in its perimeter touches the inner wall of said cylinder. The piston drum is preferably formed of two members of corresponding shape and size, to each of which is secured one of the shaft sections,

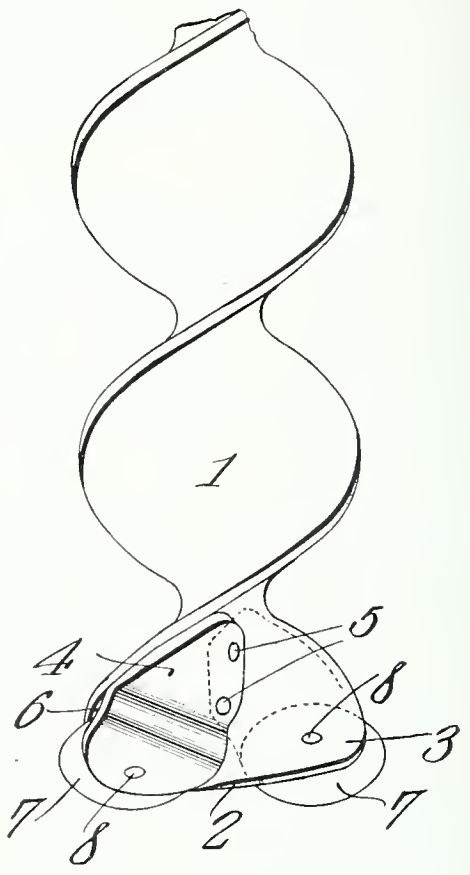


and furthermore each member of the piston drum is provided with a number diametrically extending intersecting slots 13 which serve to receive longitudinally slidable piston wings 14. The piston wings are provided at their opposite ends with recesses for the reception of anti-friction rollers 16, and the length of each piston wing and the curvature of the inner wall of the cylinder is such that no matter what the position of the wing may be, both of the rollers carried thereby will be in engagement with portions of the inner faces of said circular wall, and there will be formed between the drum and the inner wall of the cylinder, a steam space of crescentic form.

Boring Tool.

An improved mining tool has been patented by Mandie E. Thomas, of Ottumwa, Iowa, and a one-half interest assigned to Wm. H. C. Jaques of the same place. The invention is especially adapted for mining coal; and has for its object to provide a tool preferably with a twisted shank resembling an auger, the cutting edges of which consist of rotatable disks 7 pivotally mounted on the lower end of the twisted shank, each with its cutting edge in a plane inclined rearwardly and upwardly from a plane tangent to the lowest point of each cutting edge. The cutting edges of the disks project below the lower end of the shank and slightly beyond its periphery so that the hole cut thereby will be a little larger than the body of the tool.

Another object of the invention is to provide a simple means for mounting the cutting disks on the shank so that they can be quickly removed when dulled and sharp ones substituted.



A twisted skank 1 is employed having its lower end slightly convexed. A bearing plate 4 is secured by rivets on each of its faces at opposite sides of the axis. The lower end of each plate 4 is offset to produce a space 6 between itself and the shank 1 to receive a cutting disk 7, which is rotatably mounted on a pin 8. the ends of which are carried by the shank and the plate respectively. Thus, it will be seen, that an exceedingly simple and efficient boring tool is produced, there being no wear on any part except the cutting disks, and these may be replaced whenever desired.

PATENTS

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

MURRAY v. ORR & LOCKETT HARDWARE CO.

(Circuit Court of Appeals, Seventh Circuit. Feb. 8, 1907. Rehearing Denied March 15, 1907. 153 F. R. p. 369.)

1. PATENTS — SUIT FOR INFRINGEMENT—ALLEGED NEW INFRINGEMENTS.

Where a patent has been adjudged valid and infringed and an accounting ordered, it is the better practice to require the complainant to set up any alleged new infringements by supplemental bill, which can be disposed of and the order of reference modified as required, rather than to extend the accounting to devices which have not been adjudged to infringe and entail costs upon the parties which may prove unnecessary.

2. SAME—MATTERS CONCLUDED BY DECREE.

It is not open to a defendant on the question of additional infringements after a decree adjudging infringement by one device to refer to the prior art to limit the scope of the invention to less than was found by the court on the original hearing.

3. SAME—INFRINGEMENT — STORE SERVICE LADDERS.

The Murray patent, No. 442,531, for a store service ladder, held infringed.

CONTINUOUS GLASS PRESS CO. v. SCHMERTZ WIRE GLASS CO. et al.

(Circuit Court of Appeals, Third Circuit. April 22, 1907. 153 F. R. p. 577.)

INJUNCTION — PRELIMINARY INJUNCTION — DISCRETION OF COURT.

While a preliminary injunction is to be cautiously used by a court of equity, it should not be withheld if, in the exercise of a sound judgment, it is deemed necessary to prevent injustice; and an order granting such an injunction will not be reversed by an appellate court except for an abuse of discretion.

MARSHALL v. PETTINGELL-ANDREWS COMPANY.

(Circuit Court, D. Massachusetts. May 7, 1907. 153 F. R. p. 579.)

PATENTS—INVENTION-INSULATING LININGS.

The Marshall patent, No. 784,695, for an insulating lining consisting of a paper tube held in the metallic shell by its resiliency and yet easily removable, claims 5 and 9 are void in view of the prior art, as involving merely the substitution of paper as an insulating material for vulcanized fiber previously used, with no change except the minor advantage of removability which results from the fact that paper is slightly more compressible, an advantage not involving invention, and also because both claims are devoid of patentable novelty in view of the Hart "Diamond H" switchcap which preceded the alleged invention of the Marshall patent, and had a paper lining similar in use, purpose, and function.

BELLOWS v. UNITED ELECTRICAL MFG. CO. et al.

(Circuit Court, S. D. New York. May 23, 1907. 153 F. R. p. 588.)

PATENTS-INFRINGEMENT—TELEGRAPH KEY.

The Coffee patent, No. 812,183, for an improvement in telegraph instruments for transmitting signals, and known as a "telegraph key," construed, and, as limited by the prior art, held not infringed.

MARTIN v. WALL.

(Circuit Court, S. D. New York. May 23, 1907. 153 F. R. p. 589.)

PATENTS — INFRINGEMENT — TELEGRAPH TRANSMITTERS.

The Martin patent, No. 767,303, for an improvement in telegraph transmitters, held valid and infringed.

AMERICAN BREWING CO. v. BIENVILLE BREWERY.

(Circuit Court, S. D. Alabama. August 10, 1906. 153 F. R. p. 615.)

1. TRADE-MARKS AND TRADE-NAMES—DESCRIPTIVE WORD.

The word "Bohemian," placed on bottles of beer, is a descriptive term, indicating a brand of beer in the manufacture of which Bohemian hops are used and cannot be monopolized as a trade-mark by a particular manufacturer.

2. SAME—UNFAIR COMPETITION—IMITATION OF LABELS.

To warrant the granting of an injunction against unfair competition by the imitation of a label, it must either be manifest to the court on an inspection of the two labels that the similarity as a whole is such as would be likely to deceive ordinarily attentive and observing retail purchasers, or there must be proof of actual mistake by purchasers.

3. SAME — BEER BOTTLE LABELS — COMPARISON.

The labels used by the respective parties on bottles of beer compared, and held not to show such similarity as a whole as to warrant the granting of a preliminary injunction restraining defendant from using its label on the ground of unfair competition, in the absence of any evidence of actual deception of the public.

HOUGHTON v. WHITIN MACHINE WORKS.

(Circuit Court of Appeals, First Circuit. February 12, 1907. 153 F. R. p. 740.)

1. PATENTS—REISSUE-INVENTION-THREAD-GUIDES FOR SPINNING MACHINES.

The Houghton reissued patent, No. 12,263 (original No. 753,577), for an improved thread guide for spinning or twisting machines, was applied for within about four months of the granting of the original patent, which was within a reasonable time, and, in view of the broadened claims which were necessary to cover the actual invention, was a proper issue. The improvement of the patent, which consists in substituting, for the wooden finger-heads of the prior art, heads made of metal accurately hinged and properly adjusted to a vertical metal strip secured to the face of a doffing-rail, making it possible to change the thread-guide from soft to hard wire, permitting an accurate adjustment of metal parts at the outset, and under such conditions as to secure continued accuracy of position in operation, constitutes a positive advance in the practical art of cotton spinning and twisting, and discloses invention of such character as to relieve the patent in a measure from the operation of the narrow rules of construction which apply to improvement patents that only slightly advance the art. Claims 1, 2, 3, and 4, also held infringed.

2. SAME—INVENTION—SUBSTITUTION OF MATERIALS.

While the mere substitution of one material for another in a structure does not constitute invention, it is something to be considered on that issue, where it makes possible changes in other elements of a combination to produce improved operation.

PLUNGER ELEVATOR CO. v. STANDARD PLUNGER ELEVATOR CO.

(Circuit Court, D. Massachusetts. May 13, 1907. 153 F. R. p. 747.)

PATENTS-INFRINGEMENT-ELEVATOR MECHANISM.

The Cole patent, No. 700,740, for a valve mechanism for elevators of the plunger type, designed to secure an automatic slow stop of the elevator in both directions, without affecting the rate of speed in starting, cannot be so broadly construed as to cover all means of accomplishing such purpose, but is limited to the means shown, which consists of an auxiliary valve mechanism or what may be fairly considered the equivalent of such mechanism; but, since the invention is not for a mere improvement, in details of construction, but represents a new and advanced step in the art, the patent is entitled to a fairly broad construction upon the question of what may be considered equivalent means. As so construed held not infringed by the mechanism shown in the Larsson patents, Nos. 786,653 and 786,654, which does not contain the essential feature of the Cole invention, namely, the throttling of a portion of the pilot valve passage by the movement of the main valve when the elevator is stopped, nor means which are equivalent.

GOOD FORM MFG. CO. v. WHITE.

(Circuit Court, S. D. New York. May 8, 1907. 153 F. R. p. 759.)

1. PATENTS — CONSTRUCTION OF CLAIMS—ACQUIESCENCE IN LIMITATIONS.

If a patentee acquiesces in the limitations suggested by the Patent Office, and the essential elements of the claim are alluded to by reference letters indicating that the Patent Office intended to restrict the claims to the particular device described, a claim to a broader scope cannot be maintained.

2. SAME—INFRINGEMENT—NECKTIES.

The Davies patent No. 605,947, for a neck-having "the connections, C, C, secured to the inner face of the band portion adjacent to each end portion, and provided at their free ends with rings adapted to fit over a collar button," conceding it to disclose patentable invention, in view of the prior art and the action of the Patent Office in suggesting the language of the claim designating the connection pieces by reference letters, which suggestion was accepted by the patentee, must be limited to a tie having connections so secured. As so limited, held not infringed.

MERRELL-SOULE CO. v. STAR CO.

(Circuit Court, S. D. New York March 28, 1907. 153 F. R. p. 762.)

PATENTS—INFRINGEMENT—MASKS.

The Merrell patent, No. 727,173, for a mask, is limited to a mask made from a blank of "pasteboard or similar flexible material." As so construed, held not infringed.

BEACH v. HATCH.

(Circuit Court, D. Massachusetts. May 15, 1907. 153 F. R. p. 763.)

PATENTS—SUIT FOR INFRINGEMENT — ACCOUNTING.

On an accounting for infringement of a patent under Rev. St. § 4921 [U. S. Comp. St. 1901, p. 3395], the defendant's profit and complainant's damages are distinct from, and independent of each other, and are governed by different principles, and one cannot be said to be the measure of the other, nor the allowance of one to preclude recovery of the other.

NATIONAL CASKET CO. v. STOLTZ.

(Circuit Court, S. D. New York. May 22, 1907. 153 F. R. p. 765.)

PATENTS— INVENTION — FACE PLATE FOR CASKETS.

The Hamilton patent, No. 619,567, for a face plate for burial caskets, consisting of a stretched sheet of transparent non-brittle gauze fabric, involves much more than the substitution of such fabric for glass, and, in view of the novelty, great utility, and commercial success of the device, must be held to disclose invention; also held infringed.

DYER et al. v. CRYDER et al.

(Circuit Court, S. D. New York. April 8, 1907. 153 F. R. p. 767.)

PATENTS—SUIT FOR INFRINGEMENT—PLEADING.

Where a bill for infringement of a patent, in which the patentee and an alleged licensee join as complainants, is challenged by demurrer for misjoinder of complainants, and the bill does not set out the instrument of license nor allege that it is recorded, it should be produced, that the court may determine its legal effect.

THOMSON-HOUSTON ELECTRIC CO. v. McLEAN.

(Circuit Court of Appeals, First Circuit. April 11, 1907. 153 F. R. p. 883.)

1. PATENTS—TERM-EXPIRATION OF FOREIGN PATENT.

The rule applied that a patent is not exempted from the operation of Rev. St. § 4887 [U. S. Comp. St. 1901, p. 3282], making it expire with a prior foreign patent for the same invention, because there may be differences in detail between the devices of the two patents, unless such differences affect the essence of the invention in a patentable sense.

2. SAME—ELECTRIC METER.

The Thomson patent, No. 448,894, for an electric meter, expired on July 8, 1904, with the British patent for the same invention.

WESTINGHOUSE ELECTRIC MFG. CO. v. MONTGOMERY ELECTRIC LIGHT & POWER COMPANY.

(Circuit Court of Appeals, Second Circuit. April 30, 1907. 153 F. R. p. 890.

PATENTS—INFRINGEMENT-ELECTRICAL CONVERTERS.

The Stanley patent, No. 469,809, for a system of electrical distribution, was not anticipated, and claims 1 and 3 cover combinations including a converter in which the length of wire in the primary coil is substantially the same as would result from following the so-called "Stanley rule," and are infringed by a converter having such length of wire irrespective of the rule or method by which such length was ascertained.

WORCESTER COUNTY GAS CO. v. DRESSER.

(Circuit Court of Appeals, First Circuit. May 2, 1907. 153 F. R. p. 902.)

PATENTS—VALIDITY AND INFRINGEMENT—PIPE COUPLING.

The Dresser patent, No. 625,155, for pipe coupling designed to unite the ends of sections of pipe and to insulate them from each other to prevent electrolysis, was not anticipated and discloses invention. Also held infringed.

NATIONAL CASH REGISTER CO. v. GROBET et al.

(Circuit Court of Appeals, Second Circuit. April 30, 1907. 153 F. R. p. 905.)

PATENTS—INFRINGEMENT—COMBINATION OF PARTS OF DIFFERENT MACHINES.

Complainant manufactured and sold without restriction two styles of patented cash registers and indicators, numbered, respectively, 78 and 79. The two were alike, except that No. 79 contained an additional printing device, which, in combination with the other parts, was covered by a separate patent. Defendants, becoming the lawful owners of a No. 79 machine, removed the printing device therefrom and supplied and attached it to a No. 78 machine of another owner, charging and receiving payment therefor, and making, in effect, a No. 79 machine. Held that such action was an infringement of the right to manufacture the patented combination, with which complainant had not parted by the sale of the No. 78 machine.

HALL SIGNAL CO. et al. v. GENERAL RY. SIGNAL CO. et al.

(Circuit Court of Appeals, Second Circuit. April 30, 1907. 153 F. R. p. 907.)

1. INJUNCTION— PRELIMINARY INJUNCTION —SUFFICIENCY OF PROFITS.

It is a cardinal principle of equity jurisprudence that a preliminary injunction shall not issue in a doubtful case, and, unless the court is convinced with reasonable certainty that the complainant must succeed at final hearing, the writ should be denied.

2. PATENTS—SUIT FOR INFRINGEMENT-PRELIMINARY INJUNCTION.

The showing on a motion for a preliminary injunction to restrain infringement of a number of unadjudicated patents, relating to electric railway signals, held to present too many elements of doubt to warrant the granting of an injunction.

STANDARD VARNISH WORKS v. FISHER, THORSEN, & CO.

(Circuit Court, D. Oregon. May 13, 1907. 153 F. R. p. 928.)

TRADE-MARKS AND TRADE-NAMES — SUIT FOR UNFAIR COMPETITION-SUFFICIENCY OF BILL.

While the term "Turpentine Shellac," as applied to a wood filler or coating which consists principally of a mixture of turpentine and shellac, because of its descriptive character, cannot be appropriated as a technical trade-mark by one manufacturer, a bill by such manufacturer states a case for equitable relief on the ground of unfair competition, where it alleges that by reason of the long and extensive use of such term by complainant to designate its product it has acquired a secondary meaning and become associated in the mind of the public with its said product exclusively, and that defendant is using such term in connection with an inferior article of its own manufacture for the purpose of palming the same off on customers as the goods of complainant.

YALE & TOWNE MFG. CO. v. ALDER.

(Circuit Court of Appeals, Second Circuit. April 22, 1907. 154 F. R. p. 37.)

TRADE-MARKS AND TRADE-NAMES—UNFAIR COMPETITION — IMITATION OF DESIGN AND DRESS.

A manufacturer of locks who deliberately and intentionally copied a higher-priced lock made by another manufacturer in form, size, coloring, lettering, and details of finish, so that the two were substantially identical in appearance to a casual observer, and retail purchasers were likely to mistake one for the other, is chargeable with unfair competition, although the parts of the lock separately may have been open to his appropriation.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Wm. H. Schermerhorn, inventor, Ree Heights, S. Dakota; James J. Gahagan, Huron, S. Dak., assignee. Telegraph Key.—The principal object in this case is to provide novel means of a simple nature for effecting the automatic closing of the switch of a telegraph key when the operator releases hold on the key, thereby obviating the danger of leaving the circuit open. The mechanism is so arranged that when in use there is no objectionable pressure or strain upon the fingers of the operator, and a larger and more convenient actuating device or button is provided which obviates the liability of cramping the hand.

Ernest M. Marx, inventor, Burnet, Texas. Nut Lock. Ealy J. Moses, same place, assignee of one-half interest.—This device is a very simple one. The ordinary nut is transverely bored so as to intersect one side of the bolt-receiving opening, and slidably mounted in this bore is a locking device consisting of a pin having a reduced central portion with threaded or ribbed sections at the end thereof. When the nut is in place, the pin is driven transversely, whereupon one of the ribbed or threaded portions will engage the threads of the bolt and effectively prevent the nut from turning.

John W. Bauman, Sassamansville, Pa. Steam Cooker.—This invention has particular reference to cooking apple butter, though not necessarily limited to such use. One of the principal objects is to provide a novel cover, which can be applied to an ordinary barrel or other receptacle, will permit the ready introduction of the steam coil thereinto, will furthermore permit the examination and proper care of the contents of the receptacle while being cooked, and will effectually prevent the boiling over of the contents and the escape of steam in the vicinity of the operator, thereby avoiding any danger of scalding said operator.

Mrs. Minnie Franklin, Denver, Colo. Draft Implement.—The device covered by this patent is more particularly intended for laying out or drafting dress patterns. It is in the form of a simple article of manufacture having practically all the curves and measurements necessary in the dress-makers' art, the curves and scales being so associated and related that the device may be used and manipulated with great convenience and without the necessity of repeated reversals and confusing changes. Another feature of the invention resides in the arrangement, whereby the various parts or elements can be readily identified and explained, thus making the implement peculiarly applicable for use in schools of instruction.

William M. Mehring, York Road, Md. Milking Machine.—Mr. Mehring has secured a number of patents on milking machines, and has produced a simple and thoroughly practicable structure which is within the reach of every farmer. The present patent covers certain improvements in the mechanism whereby the machine is materially simplfied in construction, is lighter in weight and the parts are capable of adjustment for the purpose of taking up wear, thus avoiding lost motion and prolonging the life of the machine. In general outline, a base frame is employed, one end of which is provided with a standard that carries a pump. A seat for the operator is located at the other end of the frame, and a treadle arranged below the standard has novel driving connections with the pump. The intake to the pump is in the form of a flexible tube, to which are attached nipple cups of novel construction.

Charles S. Daniel, Melbourne, Wash. Hand Grip for Fire Arms.—The present device is in the form of an attachment that can be readily applied to fire arms and held upon the barrel at any point deemed desirable, said device affording means that can be securely and conveniently grasped when the gun is being aimed, and having no parts that are in the way either above or below the barrel. The device consists of a grip secured lengthwise beneath a yielding clip that is arranged to snugly slip upon the gun barrel. The attachment moreover constitutes a protection for the hand.

Griffith W. Roberts and Ernest L. Roberts, Poultney, Vt. Gage.—This invention is in the form of a simple attachment which can be applied to the blade of an ordinary square, and has means whereby a scale can be held in practically any adjusted position for computation and measuring purposes, thus making it peculiarly useful for machinists and other artisans.

James G. Dole, Missouri Valley, Iowa., inventor. Axle Lubricating Means. E. E. Edgecomb, and E. Espeseth, same place, assignees.—The invention covered by this patent relates to means for lubricating car or locomotive bearings, and the object is to provide a simple arrangement that will permit the use of sticks of dope, said dope being a solid lubricant well known to the art and highly effective for lubricating purposes. For this purpose, the axle has a threaded socket extending into the same from one end, and has an outlet orifice from the socket that opens through one side of the axle in a position to communicate with a recess formed in the journal brass. The stick of dope is introduced into the socket, and a plug is threaded thereinto so as to force the dope through the orifice.

Nelson Gilbert, Alexandria, Canada. Boat.—This inventor has produced a house boat, which is made up of sections so arranged that they can be compactly packed within each other, a cabin being also provided which is collapsible, the parts being easily and readily set up so as to form a safe vessel with a comparatively great amount of room therein.

Nelson Gilbert, Alexandria, Ont., Can. Fastening for Vehicle Bodies.—An object of the present invention is to provide for vehicle bodies a fastener designed particularly for securing the panels of a carriage body to the post, and adapted to engage the panels from the exterior without piercing them, thereby obviating the use of objectionable plugs, which are employed when the panels are secured to the body by screws or similar fastening devices, and which are not only discernible through the paint and varnish when the vehicle is finished, but which often work out in a comparatively short time and mar the appearance or finish of the carriage body.

Jacob H. Ullrick, Nashville, Tenn. Still.—The invention relates to means for distilling water, and the principal object is to provide a novel structure wherein air is commingled with the steam so that the flat taste of the distilled water is to a very great degree eliminated. Means are also provided for securing the escape of objectionable gases and vapors that may be brought over with the steam to be condensed. The structure as a whole is very simple and compact, is easily operated and cared for, and is so constructed that it is automatically supplied with water for condensing purposes and with water to be distilled.

Jacob H. Ullrick, Nashville, Tenn. Force Feed Seeder.—One of the objects of this invention is to provide a seeder designed for sowing all kinds of seed, such as grass, clover, grain and the like, advantageously under any circumstances, and capable of insuring a steady uniform uninterrupted flow of seed, and adapted to be readily adjusted for varying the speed of the mechanism and thereby regulating the quantity of the discharge. Another object of the invention is to provide a broad-cast seeder, which when set or adjusted, will sow exactly the same amount per acre and will discharge the same amount on the ground traversed, no matter whether the seed be large or small, or the operator walks slow or fast, or the weather be windy or not.

Jacob H. Ullrick, Nashville, Tenn. Grain Drill.—The aim of the present invention is to provide a machine adapted to sow various kinds of grass seed broad-cast, and various kinds of grain in drills, and to distribute fertilizer with the drill simultaneously with the sowing of the grain. Another object of the invention is to enable the machine to operate effectively on both clean and trashy ground, and also while turning in either direction.

Benjamin F. Fowler, Minneapolis, Minn. Three patents.—The first of these patents covers a novel form of lamp burner, in which a transparent deflector cone is employed that is arranged over the ordinary cone and is supported by spring arms that engage the inner side of the chimney, so that when the chimney is removed, this deflector cone is removed with it.

The subject-matter of the second patent is a novel form of water motor in which a pair of reciprocating buckets are employed with connections between them for insuring their movements in opposite directions. The bottoms of the buckets are opened and closed by suitable automatic mechanism. Water is fed to these buckets through separate flumes, in which operate oppositely moving gate valves actuated by levers connected to the buckets. Pumps are also connected to the levers and receive water from the flumes.

The object of the invention of the third patent is to provide a rocking horse having sectional rockers, adapted to successively advance the rocking horse when the same is rocked, and capable also of being locked against independent movement for preventing such traveling, so that the horse may remain in one place like an ordinary hobby horse.

Samuel J. McClung, Fayette, W. Va. Hasp Fastener.—It is the aim of the present invention to provide a hasp fastener, designed for use on cases containing beer and other beverages, and adapted to enable a hasp to be securely locked and sealed so that the contents of a package can not be tampered with surreptitously.

Thomas F. Dowling, Lincoln, Neb., inventor. Fire Shutter for Doors and Windows. Burt W. Richards, Edward G. Bohanan, Charles D. Mullen and Charles O. Talmage, Lincoln, Neb., assignees.—An object of this invention is to provide for doors and windows a fire shutter, adapted to close automatically in the event of a fire, should the shutter become either heated interiorly or exteriorly of the house or building to which it is applied. A further object of the invention is to provide a shutter of this character adapted to be readily opened and set for automatic operation from the interior of a house.

Calvin W. Tanner and Eugene Tanner, Columbus, Texas. Lifting Jack.—This invention has for its object to provide a lifting jack equipped with operating mechanism, adapted to enable the lifting jack to be raised by either a vertical or horizontal oscillatory movement, whereby the lifting jack may be used with great ease in places where it is impossible or inconvenient to operate an ordinary lifting jack.

John R. Horton, Memphis, Tenn., inventor. Cattle Guard. L. S. Cowles, Memphis, Tenn., assignee.—The object of this invention is to provide an efficient cattle guard adapted to be arranged in a horizontal position between the rails of the track and at the sides thereof, and equipped with rotary spiked rollers, located wholly beneath the rails, and arranged between spaced cross ties having oppositely inclined faces, in order to afford no foot hold for horses, cattle, and other animals, and also to cause the latter to slip onto the spiked rollers should they attempt to cross the cattle guard.

Evander Williams, Memphis, Tenn. Cultivator.—An object of this invention is to provide a cultivator having a plurality of cultivator blades or shovels adjustable for arranging them either in a straight line, or to form a right or left hand cultivator.

Edward Fromm and Chas. S. Edick, Eldora, Iowa. Hay Fork.—It is the aim of the present invention to provide a hay fork, designed for handling straw, corn, fodder and similar material in addition to hay, and capable of firmly binding a load of such material from the top to the bottom, and of thereby preventing the hay from escaping from the fork. Another object of the invention is to provide a hay fork, which will be maintained in engagement with the load by the weight of the same, and which, when tripped, will be operated by the weight of the load to effect a complete discharge of the material.

Daniel G. Munday, McAdoo, Pa. Window Shade Fixture.—An object of the present invention is to provide a window shade fixture, adapted to be quickly applied to a window without employing screws, nails or similar fastening devices, and without marring or otherwise disfiguring the wood-work. Another object of the invention is to provide a window shade fixture of this character capable of ready adjustment to adapt it to windows of different widths, and adapted also, after being applied to a window and without being removed therefrom, to be adjusted to fit curtains or shades of different widths.

Arthur J. Farrell, Glen Cove, N. Y. Sad Iron.—An object of this invention is to provide a sad iron, adapted to be connected to a gas jet, or other source of supply, and equipped with an improved burner constituting a section of the body of the sad iron, and provided with a continuous series of jet apertures extending entirely around the interior of the sad iron and arranged to cause the flame to impinge against the bottom of the same, whereby the sad iron will be effectively heated to the desired degree.

Max L. Huberman, Los Angeles, Cal. Automatic Sash Lock.—An object of this invention is to provide a sash lock adapted to release either or both of a pair of automatically opening sashes, and capable of controlling the opening movement and of holding the sash at the desired elevation. Another object of the invention is to provide means for effectually preventing the sashes when in any position, from being rattled or shaken by the wind.

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FOR SALE—Cash or part cash and royalty Patent No. 866,658, dated September 24, 1907. Also Canadian patent. Window Reflector. Very useful. Address, Mrs. C. J. Johnsen, 307 John St., Whiting, Indiana. nov

FOR SALE—Patent No. 864,692, dated August 27, 1907. End gates for wagon boxes. Will sell outrigbt, or on royalty. Want correspondence with wagon manufacturers. Address, Arthur Roberts, Damar, Kansas. nov

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FOR SALE—Patent No. 890,048, dated June 9, 1908. Apparatus for holding and dispensing air-tight canned goods, such as vegetables, fruits, etc., put up boiling hot and in any desirable quantity to be drawn off at will, witbout admitting air to the remainder. Address, J. M. Groce, Parkersburg, W. Va. nov

FOR SALE or royalty—U.S. Patent No. 855,998, dated June 4, 1907. Draft Rigging for Freight Cars. Has been tried and works finely. Have had calls for same already. Parties interested write H. C. Stickel, Star Junction, Pa. Canadian patent applied for. nov

FOR SALE—Patent No. 884,672, dated April 14, 1908. Lawn mower sharpener. Every user of lawn mowers wants one. Agents wanted everywhere. Agents make over 200 per cent. Address, H. E. W. Loomis, Dumont, Iowa. nov

FOR SALE—Seven new patents—brooders or incubators; apparatus for cotton spinning; funnels for filling bottles; ring knot twine cutter; also British patents. Address, John H. Turcotte, 69 Union St., Springfield, Mass. nov

FOR SALE—Patent No. 886,243. dated April 28, 1908. A wasbing machine stove that rubs and also boils tbe cloths in the same vessel. Will sell any way to suit purcbaser. Address, M. A. Patten, Milltown, Ga. nov

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FOR SALE — For cash, Patent No. 885,140, Window Ventilator and Curtain Fixture, whereby when the upper sash is lowered the curtain will also be lowered permitting the room to be ventilated without disturbing the curtain. Address, Oliver E. Brown, Washington, Iowa. sep

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FOR SALE—Patent No. 885,519, patented April 21, 1908. Simplest railway train signal known. Must sell to get money for other inventions. Price $25,000. Capitalists, manufacturers, etc., investigate. Address, John Rebar, Smithdale, Pa. sep

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FOR SALE — Patent No. 885,671. Galvanized Wire Fish Trap. Can be sold on its merits. Will sell for cash at a low price. Address, Wm. B. Eason, Ida, La. oct

FOR SALE—Patent No. 878,968, dated Feb. 11, 1908. Pipe and Bolt Wrench. Will sell outright reasonably. Address, Frank Lindsay, Etna, Pa. oct

FOR SALE—Patent No. 885,963, dated April 28, 1908. Potato Planter. Cuts, plants and covers seven acres per day. Knife and planter driven by pitman. Depth adjusted by tilting levers of ordinary mower. One man does the work of twenty. Address, John Sieffert, Winnepegosis P. O., Manitoba, Canada. oct

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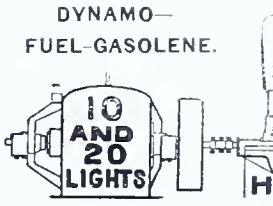
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Millions In It.

There are millions of dollars to be made by those who find means of utilizing the waste forces of Nature. The earth, the woodlands, the mines have yielded colossal wealth; but the greatest fortunes of the future await the magic touch of inventive genius which will open the way to applying the hidden powers of the air, the water and the sunshine. The man who can harness the tides and put to use the countless units of energy lost with each ebb and flow, will be a benefactor of the human race. The man who can make the sun his servant—who can find means of utilizing this enormous source of heat—will rank above the discoverer of the locomotive or the cotton gin. It is estimated that if the sun energy expended on the desert of Sahara, alone, could be harnessed, it would be more than sufficient to supplant the 800,000,000 tons of coal now used yearly by the civilized world. Whoever finds the way to turn this vast power to industrial account, will effect a greater change in human affairs than any conqueror in history has done. Chemistry and electricity open further fields for future achievement. He who can devise means to supply the exhausted earth with nitrogen from the inexhaustible source of the air, will become rich beyond the dreams of avarice.

To turn to less ambitious projects, the governments of the whole world are searching for the man who can make powder noiseless as well as smokeless. Uncle Sam has spent millions of dollars trying to make powder with less noise, and so has Great Britain. Then there are the schemes for dispelling fogs and inducing rain. The Patent Office contains a number of models of devices for the latter purpose, mostly in the form of cannon to be fired at clouds and cause precipitation. Tons of dynamite have been exploded from balloons and kites in the fruitless effort to produce rain. One western syndicate has spent $500,000 in sending chemical-laden smoke into the air—and all in vain. Less chimerical, though so far equally unsuccessful, would seem the attempts made to dispel fog. Every foggy day in London costs the street merchants $15,000. The losses in collisions on railways and in crowded harbors foot up an appalling sum. Fame and fortune stand waiting for the man who can invent a lamp that will pierce the gloom and permit trade and traffic to flow in their accustomed courses.

Who can devise a rudder for a balloon? The new science of aeronautics finds one of its most serious drawbacks in the lack of some such contrivance. Airships cannot be steered with precision, because of the absence of the denser medium for the rudder which water provides for boats. A great opportunity opens for the person who can solve this difficulty. Railroad cars that will not telescope in collision have not yet been invented, though enough money has been spent trying to invent such a car to pay the claims of those killed in railroad accidents for the past five years. One New York railroad tried the india-rubber car. About $30,000 was expended in building these vacuum cars, as they were called. They were made perfectly tight and the air was pumped out, the idea being that when placed back of the engine and at the end of a train, they would have something of the effect of a pneumatic tire, and break the force of a collision. In the very first trial the cars were smashed to a thousand pieces. These are but a few of the numerous problems, the solutions of which will not only be of incalculable value to humanity, but will promise great financial returns to the discoverer.

Most Powerful Microscope.

As science pushes back toward the real basis of the phenomenal world, the methods of investigation become more delicate and technical and the need is felt for finer methods of measurement, of weighing, and of calculating. But in no department is this need for greater accuracy and discernment more keenly apparent than in the domain of microscopy; for the scientist believes that with a powerful enough microscope he could tear away the veil of mystery, and could even trace the atom to its lair. The Illustrirte Zeitung of Leipsic contains a description of a great improvement that has been made in the microscope. In order to make progress in the old field, it was necessary to find an entirely new way: and this was discovered by Dr. Zeigmondy, of Jena. The doctor is well known through his work with ruby glass, and his investigations in this line led him to believe that it was quite possible to examine infinitely small bodies which are not visible with any of the microscopes now in use. Everyone is familiar with the particles of dust that float in a sunbeam; but these particles are so small that the strongest microscopes hardly reveal them, and they are visible to the naked eye only because the line of sight happens to form an angle with the sunbeam. It is really the reflection from the particle that is seen by the observer. Now if we put in place of the sunbeam, a concentrated artificial light, and aid the eye with a microscope, we have the principle of the new device. Dr. Zeigmondy relied on this theory to establish the particles of gold which give the color to ruby glass. In the ordinary microscope these gold particles are not visible, and in order to bring them under the action of the light, a cone of light was concentrated on a ruby glass plate, and a microscope placed so that its axis was directly above the cone, the focus of the lens coinciding with the point of the cone. The reflections of the particles were then visible.

In view of the discoveries already made with this new microscope, it would not seem extreme to predict for it a place in the eventual explanation of the constitution of matter. The new method will be of great value in medicine, as it makes visible bacilli hitherto unseen.

Where Men Work by Hand.

This is the age of machinery, and cunning contrivances multiply on every hand. Man is dependent upon mechanical apparatus to an extent hitherto unknown. Every hour of modern life is full of the achievements of invention. The business man is awakened by an alarm clock, bathes with the aid of various sanitary appliances, puts on patented suspenders, collar and cuff buttons, and other articles of attire, timing himself by a watch that is one of the triumphs of modern ingenuity. His food is largely prepared by machinery; the egg beater, the centrifugal skimmer, the ice machine, the sundry contrivances of the range, all contribute to his comfort. He takes an electric car to his office, lighting a patented cigarette with a patented match on the way. A patented elevator whisks him to the proper floor, and a host of office conveniences—typewriters, phonographs, safes, desks, patented pens, pencils, inkstands, thumb tacks, attaching devices, files for letters, etc. etc., facilitate his work. If he wishes to speak to an acquaintance, there is the telephone: if he wishes to send a message, electricity is at his service in other apparatus. We cannot conceive of modern existence without all these devices, which are daily multiplying. Machinery, we have come to think, can do anything in the line of industry; hand work is only a fad of the rich. And yet, surprising as the fact may be, there are important trades in which machinery has not taken the place of hand labor—trades that are carried on in much the same manner as they were generations ago.

Pottery, for instance, has made little advance since the days of Palissy. Improvements have been effected in details, but the implements used are the crudest, and machinery plays practically no part in the industry. No apparatus can be devised which can exercise judgment in dealing with the widely varying materials that pass through the hands of the potter.

Glass, too, is made in nearly the same way as it was when Venice first sent her wares out for the admiration of a circumscribed world. Visitors to the most up-to-date glass establishments cannot fail to note the simplicity and antiquity of the processes. Many machines have been devised to take the place of the glass blower's lungs; but in this instance the man is still superior to the machine.

Another example is found in the manufacture of gold leaf. Strips of gold are still beaten entirely by hand, as each strip of gold requires special treatment. It is true that machinery has been invented in other industries that is so delicate and so marvelously adjusted that it has every appearance of being able to think; but none yet has been discovered that can adapt the blows to the exact requirements of each piece of gold leaf, which becomes so fragile that a single wrong stroke would ruin it. Nor is there an apparatus that has the lightness of touch necessary to lift up and pack the finished product.

Glove making, too, is largely a hand trade. The gloves are stitched by machines, but no machine can cut out a glove properly, for the reason that it cannot distinguish between thick and thin, good and bad, pieces of leather. Each kind of leather requires special treatment in shaping, and therefore the cutting cannot be mechanical.

In the same way the cutting of cigar covers from tobacco leaf is done by hand. The best brands of cigars are also handmade, as defects in the leaf are beyond the power of a machine to judge. These and other important trades still await the inventive genius that can make them mechanical.

Have Plants Eyes?

Many plants act as if they could see, and none of them are as stupid as they commonly get credit for being. The behavior of vegetables toward light is especially remarkable. House plants always grow toward a window, and if the pot be turned around, the leaves manage to screw themselves back into their old positions. The action of sunflowers and morning glories is a matter of common knowledge. In temperate countries, leaves grow at right angles to the rays of light, to get as much of it as possible; in the tropics they set themselves edgewise, to get as little.

Evidently, then, says a writer in *Collier's*, plants come as near seeing as do some animals. A German botanist, Haberlandt, who has been studying the problems, has concluded that the whole upper surface of each leaf is a a sort of compound eye. The thin, translucent skin which, in most plants, covers the green succulent tissue of the leaf, is in certain cases composed of innumerable round cells. These it is thought are so many minute lenses which concentrate the light upon the living substance below, and enable the plant to distinguish between light and darkness, or between weak and strong ligbts, though not to see objects. Such primitive lenses are found in the fig, ivy, magnolia, wood sorrel, and other plants. The pepper and the balsam have, be-

sides, little eye spots, which in structure approach the eyes of many of the simplest animals. Each of these supposed sense organs can be made to print a bright spot on a photographic plate. A curious fact is that plants attend only to the blue rays of the sun; for though they grow well in red or yellow light, they show not the least inclination to turn toward it.

Blue Light Produces Insensibility.

A Swiss physician has discovered that extraordinary effects are produced by blue light. He claims that insensibility can be obtained if the rays of a blue electric light are brought to bear on the human eye, while all other rays of light are excluded. Such a degree of unconsciousness can be produced that teeth can be pulled without the patient suffering pain. No explanation is offered of the cause of this discovery.

New Oil Motor.

A new motor which employs crude oil for its power is being introduced in Europe, according to our Consul General at St. Gall, Switzerland. The improvements claimed for the motor are that it will burn any kind of oil, especially the cheapest crude oil, with perfect combustion and decreased consumption as compared with ordinary types, obviating clogged cylinders and evaporating pipes. Since crude oil costs much less than gasoline, this invention would mean a perceptible lessening in the expense of running an automobile.

Explosion by Music.

One of the most dangerous of all explosives is a black powder called iodide of nitrogen. When it is dry the slightest touch will often cause it to explode with great violence.

There appears to be a certain rate of vibration which this compound cannot resist. In experiments to determine the cause of its extreme explosiveness, some damp iodide of nitrogen was rubbed on the strings of a bass viol. It is known that the strings of this instrument respond when those of a similar instrument of an equal tension are played upon. In this case, after the explosive had become dry, another bass viol was brought near and the strings sounded. At a certain note the iodide of nitrogen on the prepared instrument exploded. Experiments showed that the explosion occurred only when a rate of vibration of sixty a second was communicated to the strings.

Combined Stopper and Pourer.

Among recent examples of ingenious mechanism is a stopper and pourer for vessels containing liquids. The invention, which is described in a consular report from Buenos Aires, consists of a discharge spout, which, when not in use, lies in an inverted position inside the vessel. The butt end of the spout is closed by a small plate and secured by a ringed cap screwed over all which thus forms the stopper proper. It is claimed that this device can be manufactured in tin, or in any special composition to be used with wines, etc., at a very low cost; also that the ringed cap, being raised slightly above the level of the closing plate secured by it, forms a depressed space adapted to receive a seal. The unscrewing of the cap and opening of the vessel cannot be accomplished without breaking this seal, a guarantee of the quality of the contents of the bottle being thus afforded.

Potato Flour.

It may be news to many who live in this country of abundant harvests, that the inhabitants of lands less fortunate than our own are obliged to manufacture flour out of other products than wheat. In the West Indies, flour is made from bananas; in Mexico and in Africa, starchy weeds are used for the purpose; and potato flour is commonly employed in Germany. In preparing potato flour, the vegetables are first washed, then crushed into a cold pulp. This is passed into a steam heated drum and thoroughly dried, then cooled and ground into flour. The resultant product is very fine in appearance, somewhat resembling corn starch, and is especially well adapted for making cake, etc. Potato flakes are prepared in much the same manner. The steamed potatos are crushed between rollers, and come off in the form of flakes, which, when cool, are suitable for cattle feed.

New Ideas in Refrigerators.

A novelty in ice machines is described in French exchanges. It consists of a rotative compression machine, which regulates itself to all speeds, whatever may be the temperature of the condensing water used. The special feature is a cylinder in which the chemicals are sealed, which, revolving in water, produces ice. The chemicals do not require to be renewed, and last, it is claimed, as long as the machine itself. The machine has no joint piece, no pressure gage, no suction or regulating valve, and no pipe, tap or circulating pump. It requires neither steam nor fuel, and will work in water reaching even 113 degrees F. It saves 98 per cent of cooling water and 70 per cent of motive power, as compared with any other freezing system known. It is said that this is the first ice machine ever invented which does not require to be fed with chemicals.

A description of a much simpler device comes from Germany. This apparatus, which costs only about a dollar to make, consists of a double walled tin vessel with a capacity of some five gallons. Into the hollow space between the two walls, which is about an inch in width, carbonic acid is introduced, passing from this chamber into the vessel at the top through a cross armed tube. By the agency of this acid, the contents of the vessel are frozen very rapidly, water being changed into ice within the space of sixty seconds. This effect is produced by the sudden great reduction of temperature caused by the rapid expansion of the carbonic acid, which is admitted from an ordinary reservoir. The device is especially adapted for household use, and will be found of great advantage in hospitals, etc.

Insulating With Aluminum.

A device which may become of considerable importance to the electrical industry has recently been introduced in England. It consists in the winding of magnet coils with bare aluminum wire, the turns of which touch each other in the same manner as if the wire were especially insulated. The well known property of aluminum to become covered with a layer of oxide which offers strong resistance to the electric current, was utilized in the device described. Practical tests have proved that it means an economy in cost of 50 per cent, as compared with insulated copper wires. It also means an economy in weight, and a far greater safety in operation for many purposes; for instance, in damp places or places filled with gas, for electric railways, crane motors, etc.

As aluminum oxide does not possess the property of coming off in thin layers, like the oxides of all other insulations, such as rubber, silk, cotton, etc., aluminum coils will stand a very high temperature.

The process of manufacture is simple. Coils mounted on spools are wound in the usual manner, with the only difference that intermediate layers are placed between the single layers. which should consist of paper, asbestos, or some such material. It has been shown that the layer of oxide forming the insulation of the wire, (aluminum oxide being nothing else than the raw material of porcelain), is increased by the action of dampness upon the coil in such a manner that several hundred volts are sometimes required in order to break down the insulating layer. It appears from this that coils used in the open air, such as field coils for electric railways, telegraphs, electric bells, etc., are not affected by dampness if made from bare aluminum wire, but, on the contrary, will improve with exposure.

Motor Sled.

With the extended use of motor cars, many efforts have been made to adapt the mechanism to the use of sleds: but special disadvantages have attended this form of locomotion. Motor sleds have been devised that would move well over firmly packed snow or ice surfaces, but they have been, as a rule, stalled by fresh fallen deep snow, as well as by rising grades. A device which has just been introduced promises to enlarge this field, by its adaptability to varied conditions of travel. The propulsion of the sled is accomplished by a paddle wheel driven by a motor placed under the rear seat. The main parts of the wheel consist of a cylinder which is attached to the hub by two rows of spokes, and paddles that are connected with the surface of the cylinder. These two parts co-operate in motion in such a manner that the cylinder constantly presses the snow, and thereby increases the resistance that the paddles find when they come in contact with the snow. When the sled is to be used on ice, segment gears with sharp points are provided upon the ends of the paddles. In order to adjust the paddle wheel to different depths of snow, a hand lever is provided. To prevent breaking the paddles on uneven ground, the axle of the paddle wheel is placed on both sides. The sled is steered by a hand lever which moves the paddle wheel along its axle, and is stopped by a lever which operates the brake. With a powerful motor and broad enough runners, the motor sled can ascend steep grades.

Pneumatic Travel.

The carrying of parcels through tubes by means of air pressure is by no means a new idea. In our larger cities the postal service accomplishes wonders through this agency, and pneumatic tubes have been used for other purposes with signal success. But so far the size of the tubes has been limited, and experiments have led to the belief that it would not be possible to use tubes larger than 10 inches in diameter. The *Technical World*, however, contains a description of a recent device on a much larger scale. A Chicago man has constructed a tube two feet in diameter, and has driven a carrier weighing two thousand pounds through it. Indeed, the inventor has passed through his own tube at a dizzy rate of speed.

From the description given, it appears that a long tube—say ten miles in length— is taken and divided into sections of about half a mile. The division is made by the use of valves; each section, because of the valves, acting independently of the others. Beneath the carrier tube mentioned is a similar tube running through the full distance without division. Ducts connect each section of the carrier tube with the other, through which the vacuum in the carrier tube is created. A large fan, fastened to one end of the undivided tube, draws out the air under strong pressure. Naturally the partial vacuum created in the long tube exists also in any section of the tube above it, the valve of which is open to permit passage of air to the long tube.

The first section of the carrier tube is the one first affected. A carrier put into it shoots swiftly through it, strikes a trap door, trips the trigger of a valve, opening the section to the operation of the vacuum producing fan, and at the same time closing the first section. At the time of this operation, the flying carrier opens a valve leading to the outer air, permitting the natural air pressure to get in and push. Tests with an electrical apparatus show that with a 10-pound pressure, the air column moves in the tube at a speed of nine miles a minute. Such a high speed for the cars will probably never be attained, but even a mile a minute maintained continuously would be a powerful saver of time. With the pneumatic service established between cities, distance would be annihilated. It would not be necessary to slow down at crossings or in passing through small towns: there would be no danger of collision with other trains, no smoke, no cinders, and relatively little noise. The traveler of the next generation can take his choice between flying over the housetops and burrowing beneath the earth.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy: twenty copies $1.50.—Please give correct data in ordering.—Address,

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Dust-separating appartus.....F. Martin
Dye and making same, Anthracene..H. Wolff
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Electric-circuit controller.....D. B. Sawyer
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Electric machine, Dynamo-.....G. S. Dunn
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Electrical-conductor coupling.....W. C. Hafemeister
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Electromagnet.....H. W. Cheney
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Feed-mechanism controlling device.....W. H. Stedman
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Filing device.....L. Senge
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Fluid-pressure brake.....J. W. Cloud
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Rocking-horse, Traveling.....S. Spain
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Rotary kiln.....W. R. Warren. (Reissue.)
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Spring-clip.....G. W. McGill
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Stone-dressing machine.....A. G. Grice
Stopper.....E. H. Marshall
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Ventilator.....O. F. Hillpot
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Washtub, Metallic.....M. E. Gray
Watchcases, Swivel-pendant for..W. E. Porter
Water-current motor.....J. H. Rische
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Celluloid uninflammable and incombustible, Rendering.....P. Marino
Cement by treating hot liquid blast-furnace slag with milk of lime, Manufacturing.....H. Colloseus
Cement by treating hot liquid blast-furnace slag with solutions of alkaline substances, Manufacturing.....H. Colloseus
Cement from blast-furnace slag, Manufacturing a sea-water-resisting.....H. Colloseus
Cement-post fastener.....C. B. Ingraham et al
Chain, Belt-.....S. F. Clouser
Chain, Drive-, 2 pats.....W. M. Butler et al
Chair, Friction drive-.....E. J. Conklin
Chair.....A. Wanner, Jr.
Chair automatic fan attachment, Rocking-.....H. A. Keck
Chair-seat.....E. A. Levick
Chicken-culture apparatus.....V. C. Koons
Chuck, 3 pats.....I. A. Weaver
Chuck, Drill-press.....F. Schneider
Chute, End-loading.....G. Holmes
Circuit-breaker, Disturbance-operated.....L. D. Haas et al
Clip.....E. M. Silvermann
Cloth-pressing machine, Rotay.....G. W. Voelker
Clothes-line.....A. J. Bryant
Clothes-line support.....A. Malsin
Clothes-line supporter.....J. N. Gassett
Coal pocket or bin.....G. W. Freeland
Coal-pockets, Weighing mechanism for.....G. W. Freeland
Cock, Angle-.....W. E. Farrell et al
Cock, Gage-.....T. Watkins
Cock, Gas-.....D. E. Hopper
Cock or faucet.....J. W. Sharp, Jr.
Coffee-urn.....J. H. Beckman
Coin-carrier.....L. Zamboni
Collapsible box.....W. G. Post
Collar-fastener.....A. Zier
Collar-supporter.....F. A. Ballou
Coloring material and making same.....F. J. Maywald
Column-clamp.....R. J. and T. W. Batt et al
Comb-cleaner.....F. Danner
Compass, Beam-.....M. A. Smith
Computing-machine.....J. T. Jackson
Computing machine, Wage-.....G. E. O'Brien
Concrete-block-press machine....F. E. Wilkison
Concrete or cement construction, Reinforcement for.....W. C. Gabriel
Concrete or cement pipe.....E. H. Ames
Condenser.....R. Herman
Conduit, Flexible.....G. A. Lutz et al
Contract-breaker.....G. A. Unterberg
Convertible seat.....A. P. Herrington
Cooking-pan.....B. Compston
Cooling apparatus.....W. J. Hamilton
Copying-machine.....E. C. Magnus
Cord or thread the component strands of which are coated, Coated.....E. D. C. Bayne et al
Couch, Knockdown folding...W. J. Grotenhuis
Coupon-cutting shears.....J. Steel
Cow-tail holder.....E. S. Easterday
Crate, Folding.....E. Roadifer
Cultivator, Walking hand-.....J. E. Hosmer
Culvert, Expansion-.....J. Croy
Curtain-fixture.....S. J. Tracy
Cycle motor, Two-.....G. L. Langer
Damper-regulator.....W. P. Dennis
Damper-regulator for heaters.....R. I. Roney
Dental-broach-covering mechanism.....R. Siegel
Desk, Portable.....J. O. G. Allenson
Dichlor-ethoxy-ethylene, Producing..G. Imbert
Door check and closer.....J. Fairhall, Jr.
Door check or catch.....F. M. Case
Douche, Nasal.....E. W. Grove
Dreding apparatus.....D. P. Moore
Dressing-sack.....L. M. Anderson
Drilling device, Hand.....C. W. Skinner
Dust-collecting systems, Pipe-reducer for.....W. E. Allington
Dye, Green anthracene.....J. Deinet
Dyes, Making sulfurized.....B. Homolka et al
Dycing fibrous material, Apparatus for.....R. Dawson.
Dynamos and electromotors, Rotor for.....J. Hissink
Eaves-trough hanger.....C. C. La Clare
Edge-setting iron.....C. Jörgensen et al
Educational device.....G. B. Oldroyd
Eel-trap.....J. H. Sellman
Egg-breaker.....S. M. Beel
Electric currents, Swivel-joint for.....A. B. Smith
Electric heater, Illuminated.....F. C. Green
Electric machine, Dynamo-.....W. L. Waters
Electric machine, Dynamo-.....J. Burke
Electric regulation.....M. Moskowitz
Electric selective system.....F. D. Pearne
Electric transformer-furnace.....O. Frick
Electrical condenser.....G. W. Pickard
Elevator safety apparatus.....C. W. Hoffman
Engine starting device, Explosive-.....J. E. Denison
Engines, Lubricating-filter for.....J. R. Whittemore

Engine-starting jack....G. A. Bull
Envelop....W. E. Baldwin, Jr.
Envelop, Safety-....H. G. Taylor
Extension-table, Pedestal....C. W. Prentiss
Extension-table, Round....L. Ponet
Eyeglasses....P. Moews
Eyeglasses....H. Seudder et al
Eyelets, Forming blanks for covering....A. Latham
False bottom....J. Kline
Feed-box....L. G. Groh
Fertilizer-distributer....L. Bailey
Filter....C. H. Loew
Firearm-sight....F. Phillips
Fire-extinguishing cabinet....W. E. Luhman
Fish bait or lure....W. Shakespeare, Jr.
Fluid-compressor....F. Felbinger et al
Fluid-controlling device....A. Ullmann
Fluid-motor....C. W. O. Wittke
Flushing-tank....C. Wilms
Folding, cutting, and paste table....C. D. Sherman et al
Foot-protector....M. Schultz
Form improver, Coat-....S. Goodfriend
Foundry-flasks, Bottom board for..J. L. Butler
Friction-top can or vessel, Open-mouthed....G. W. Weber
Fruit-jars, Device for truing caps of....L. H. Fischer
Fuel, Facilitating the combustion of....N. W. Bloss
Furniture, Knockdown article of..P. Morrison
Furniture-rack....V. C. Luppert
Garbage-bag....L. Thomas
Garter-fastening device, Men's....R. A. Moore
Gas cut-off, Automatic....E. Turner
Gas-producer....W. B. Hughes
Gas-producer, Suction....J. Bowey, Jr.
Gear-wheels, &c., Machine for finishing the teeth of cast-metal....G. W. Baker
Gearing, Feed-....J. B. Hart
Gem cutting and polishing apparatus....W. H. Griesch
Generator....K. Kishi et al
Girder, Reinforced....E. A. Moccetti
Glass-blowing machine....W. S. Teeple
Glass-grinding machinery..C. L. Goehring et al
Glass-producing system....L. Mambourg et al
Glass tiles, Method of and apparatus for forming....W. T. Nicholls
Glycin derivatives, Producing....G. Imbert
Governor, Centrifugal....G. W. Younkman
Grain-bin....T. Dougherty
Grain-drier....P. Provost
Grain-storing apparatus....R. Tolson
Grate....G. W. St. John
Grinding-mill....J. Barr et al
Gun, Breech-loading....G. W. Parry
Gun-sight....F. L. Putney
Gun, Single-trigger double-barrel, 2 pats....E. M. Funk
Gun-stock....F. Balson
Hammock....E. C. Ince
Hammock-support....M. J. Scanlan
Hanger....J. J. Ronan et al
Harp....J. P. Gannon
Harrow, Disk....R. S. Wells
Harrow, Sulky-....G. W. Fergueson
Harvester, Beet-....L. Heiser
Hay-rack....J. M. Fuller
Hay, straw, or like cutting knife....R. Jones
Heat and pressure regulator....E. J. Ryan
Heating and ventilating system....H. A. Wernecke
Heating and welding furnace....W. N. Best
Heating apparatus for heating buildings and the like, Device for evaporating water in....G. Struck
Hides, Treatment of....R. Withey
Hinge....H. Kirschbaum
Hinge for vault-light and other doors....W. N. Mayhew
Hinge, Gate-....P. McCollum
Hoist, Counterbalance-....W. Van Wie
Hoisting-machine....C. E. Grant
Hose, Machine for winding metallic....W. Schwarz
Hydrocarbon-burner....J. F. Barker
Hydrocarbon-burner....L. A. Blubaugh
Hydromotor....A. Graf
Incubator....L. Carlberger
Incubator-heater....L. P. Harris
Insulating machines, Head for....V. Royle
Internal-combustion engine....S. I. S. Ringi
Iron and steel, Copper-clad....J. F. Monnot
Ironing-board, Folding....J. Kresge
Journal-box....C. W. Barber
Keyboard....A. H. F. Schaar
Knitted hosiery....R. W. Scott
Lamp, Electric-arc....F. M. Lewis
Lamp, Gas-....A. Rector
Lamp socket, Incandescent-....W. F. Ritter
Lamps in series, Operating electric arc-....F. M. Lewis
Lantern-bracket....A. E. Choate
Lathes, planing-machines, and other analogous machine-tools, Tool-holder for..E. J. Günther
Laundry-bag....D. P. Moore
Lavatory....J. H. Gavin
Leaflet-holder....C. Blum
Leuco derivative of the gallocyanin series....W. Lommel
Level....W. G. and F. W. Fuessel
Lifting-jack....F. E. Modlin
Lighting device....O. K. Thomson et al
Lightning-arrester....R. D. Mershon
Lightning-arrester for electrical circuits....R. B. Ingram
Load raising, lowering, and conveying or transporting apparatus....J. R. and J. Temperley et al
Loading or ditching apparatus....L. Kniffen
Lock strike-plate....A. Nathan
Lock system, Electrical permutation-....H. T. Cleary
Locomotive safety-stop....W. H. Brown
Log-skidder frame....J. R. McGiffert
Longitudinally-apertured body, Making a....W. E. Ludlum
Loom, Narrow-ware....O. W. Schaum
Lumber-guide mechanism....F. M. Barto
Machinist's clamp, Reversible....W. T. Russell
Magnet for dynamo-electric machines, Field-, 2 pats....A. L. Cushman
Magnetic separator....C. G. Buchanan
Mail-bag catcher and deliverer....H. H. Akers
Mail-bag catcher and deliverer....J. A. Douglas et al
Mail-box....W. W. Plummer
Mail receiving and delivering apparatus....T. Allatt et al
Mangle-apron guide....E. P. Wood
Manicure implement....T. Miller
Manure-distributer....S. H. Garst
Manure-spreader....C. L. Dyk
Marble-sawing machine....J. R. Peirce
Marking-tag....A. H. Swett
Match-box holder....W. S. Tarbox
Mattress....F. Hoffmann
Measuring the distance between bearings of moving parts, Instrument for....C. Rodé et al
Mechanical movement....J. Stuart
Mercury-vapor apparatus, Starting device for..G. Schwarz et al
Metal belts and for connecting the ends thereof, Means for strengthening....C. Eloesser
Metal body and producing same, Compound, 4 pats....J. F. Monnot
Metal-flanging press....J. W. Nesmith
Metal-plating, Device for producing electrolytic....A. Schmitz
Metals, Machine for extruding..G. H. Benjamin
Metallurgical furnace....W. N. Best
Microscope and camera, Combined....R. L. Watkins
Microscopes and the like, Mechanical stage for....R. L. Watkins
Middlings and other materials, Method of and apparatus for purifying....H. S. Jewell
Milk-top extractor....H. Barry
Milk-vat....A. F. Stoelting
Mines, Means for ventilating and expelling water from....P. H. Durack
Mining-tool....M. E. Thomas
Mirror, Adjustable....B. L. Harris
Mirror for optical instruments and making the same....G. N. Saegmuller
Molding-machine....A. Green
Mortising and grooving machine....L. Lubin
Motor operated by liquefied carbon dioxid....G. Brousseau
Motors, Distributing-gear for explosion-....M. Thier
Music-player action-valve, Automatic self-adjusting pneumatic....E. B. Hough
Music-players, Endless-roll mechanism for pneumatic....E. B. Hough
Music-playing instrument, Autopneumatic....W. R. Crippen
Musical instrument, Bowed....E. H. Amet
Musical-instrument mechanisms, Controlling device for....P. B. Klugh
Musical instrument, String....O. G. J. Koch
Musical instruments, Supporting means for swinging parts of....A. E. Turnquist
Nose-bag suspension....L. D. Cammann
Nozzle....J. Rosborough
Nut-lock....C. S. Norris
Oil-burner....J. Schurs
Ordnance, Sighting and working of quickfiring....A. T. Dawson et al
Ore and other materials, Crusher for....H. Eggers
Ore-concentrator....G. H. Davidson
Ore or other substances, Mechanism for agitating and handling....J. Smith
Oven, Drying-....J. Horner
Oven-illuminating device, Bake-....C. N. Bergmann
Oyster-carrier....R. C. Bender
Package-binder....W. G. Richards
Package-fastener....F. S. Meyers
Packing box or carton, 2 pats....J. T. Ferres
Packing box or carton....J. G. Reber
Packing, Piston-....P. E. Williams
Paints and other coatings, Producing....K. Lörinez
Paper box and like article....W. H. Somers
Paper-box machine....A. W. Mitchell
Paper-folding machine....O. W. Johnson
Parallel clamp....H. A. Adams
Paste-cup....W. H. Redington
Paste-cup....W. Rodger
Pavements, Repairing vault-light....P. M. Bruner
Pen and pencil holder....E. Danne
Perforating, punching machine, &c....F. H. W. Higgins
Photo-engraved plates, Hand-liner for....V. Royle
Photograph-holder, Extensible....W. J. Satterlee
Photographic view-finder....W. R. Elliott
Piano-action....H. O. Clark
Picture-hanger....J. N. Copeland
Pipe-coupling....E. A. Cleland
Pipe-laying means, Dredging-....P. S. Smith
Pipe lifting and gripping appliance..G. J. Hauk
Pipe trap, Waste-water-....W. J. Frost
Pipe-wrench....J. Cooper
Plant-protector....J. A. Byrne
Planter....S. H. Tinsman
Plow....S. H. Tinsman
Plow and harrow, Combination...E. J. Steele
Plow, Motor-....C. A. Hart
Plow sulky attachment....J. W. Turner
Pneumatic cleaning systems, Suction apparatus for....W. Locke et al
Pneumatic-despatch-tube apparatus....A. W. Pearsall
Pneumatic suction, Apparatus for removing dust by....W. Locke et al
Pneumatic suspension means....J. H. Clark
Portable elevator....A. F. Meyer
Postal card....J. Draemel
Potato-digger....C. R. Dodge
Power-transmitting device....A. W. Whitcomb
Power-transmitting mechanism, Controllable....E. F. Jewett
Press....G. J. Blum
Press....F. W. Barhoff
Pressure-controlling device, Automatic....W. F. Krichbaum
Printing-machine and enlarging-camera, Combined....A. Kaiser
Printing-machine, Hand....J. A. Spooner
Printing-machines, Type-holding device for....S. Brown
Printing on boards, Machine for....H. W. Morgan
Projectile....C. V. Wheeler et al
Pulley-housing....C. A. Brinley
Pulley housing, Sash-....C. A. Brinley
Pulley or wheel....L. Zamboni
Pump, Air and like....D. B. Morison
Pump, Cream-....E. Lindblad
Pump, Painting or whitewashing....E. Brinkmann
Pumping-jack....C. J. Engle
Rail-brace....A. J. Knouse
Rail-joint....J. Mayer
Rail-joint, Insulated....A. Morrison
Rail-splice....W. D. McKeown
Railway-brake....W. H. H. Diffenbauch
Railway-crossing....L. Alexander et al
Railway-gate....L. A. Wheelock
Railway-signal, Electric....W. H. Harris
Railway-signals, Track instrument for....J. F. Dineen
Railway-switch signal....W. H. Harris
Railway-tie....H. L. Williams
Railway tie and connection..G. H. Shane et al
Railway-tie and means for securing rails thereto....L. G. Sedberry
Railway-track-clearing device....J. A. Shires
Railway-tie and means for securing rails thereto....L. G. Sedberry
Railway-tie, Metallic....A. Miller
Railway-track-clearing device....J. A. Shires
Railway-track-rail fastener....J. T. West
Reel for sectional skeining....E. Barton
Removable seat....C. Lederman
Resilient wheel....J. C. Turnage
Retort-charging apparatus....H. Crocker
Ribbon-receptacle....E. Anishänsli
Rock-drill....R. H. Anderson
Rolling-mill for the manufacture of pipes and other hollow bodies....O. Heer
Rooms in mansions of all kinds, especially hotels, sanitariums, and the like, Construction and arrangement of sitting and bed....B. Scherl
Rope-carrier....F. V. Drake
Rotary engine....G. Hidden
Rotary shovel....E. W. Nichols
Routing-machine....V. Royle
Sash-fastener....C. V. Walker
Sash-holder....W. M. Dight
Sausage-stuffer, 2 pats....G. R. Napier
Saw, Endless chain....S. J. Bens
Scraper....W. H. Compton
Screen....H. K. Hansen
Sector for dividing-heads, Indicating-....I. Van Huffel, Jr.
Separator....A. P. Wetterauer
Sewing implements and materials or the like, Holder for....A. Mützell
Sewing-machine stop-motion..H. W. Slater et al
Sewing-machine threading device..S. B. Battery
Shaft-coupling, Flexible and elastic..L. Girardot
Sheet-metal can, Removable-cover....B. H. Kannenburg
Shipping-box....F. C. Mitchell
Shirt....L. Dinger
Shock-absorber....L. S. Watres
Shoe-operatives' knives, Electric heater for....E. N. Chandler
Signaling mechanism....W. H. Gilman
Siphon....D. Landau
Smelting....J. H. Boyd
Smoke-consumer....P. A. C. Nygaard et al
Snap-switch, Rotary....H. C. Williamson
Sole-marking machine....F. J. Burke
Spark-plug....C. T. Van Woert
Spectacles, Eye guard and shield for....W. C. Bayless
Spinning or twisting apparatus, Ring....A. W. Beardsell
Spoke-jack....J. A. Alley
Sprouting appartus....F. A. Peters
Square, Folding....W. B. Seymour
Stacker attachment, Wind-....G. W., R., and A. Kennel
Stamp....B. Kiam
Steam-boiler....J. Erwood
Steam-engine....R. Hay
Steam-generating system....A. W. Bebber
Steam-generator burner....F. E. and F. O. Stanley
Steam-trap....J. T. Lindstrom
Step, Extension-....E. V. Wells
Stereopticon-lanterns, Slide-carrier for....C. W. Finch
Stock-waterer....J. J. McCourt
Stool, Milking-....A. A. Jones
Stove-valve-locking device, Gas-..W. Schwering
Strainer, Milk-....E. M. Frazee
Strainer, Water-....J. O. Olson
Strainer, Water-....H. Mueller
Stuffing-box....J. H. Gately
Sulfurous leuco bodies and making same....B. Homolka et al
Surface-finish, One-coat....G. Dosselman
Surgical appliance....L. G. Scarpa
Sweeper....O. Kampfe
Switch....J. L. Bailey
Switching-indicator....W. L. Sullivan
Table-locking device, Pedestal-....E. Tyden
Table-locking device, Pedestal...C. S. Burton
Tag for neckwear and the like..S. L. Bachrach
Talking-machines, Automatic needle-clamp for..G. Königstein
Tank-heater....G. E. Bishop
Tanks, Means for producing circulation in liquid-....J. Heuscher et al
Telautograph....F. Ritchie
Telegraph transmitting instrument....F. H. W. Higgins
Telephone-relay....C. W. Underwood
Telephone repeater system....N. G. Warth
Telephone set, Hand....G. F. Atwood
Telephones, Intercommunicating....H. C. Thomson
Telescope, Ordnance-bore sighting-..S. Czapski
Telescoping device....C. L. Gardner
Telltale apparatus for running machinery....H. O. Ormiston et al
Therapeutic purposes, Means for producing and utilizing rays of light for....C. E. Rogers
Thermostat....W. F. Gossick et al
Tile-machine....C. L. Baldwin
Time-recorder, Workman's....W. D. Doremus
Timepiece....E. Aufiero
Tire....H. B. Baruch
Tire, Cushion-....C. L. Rempes
Tire, Vehicle-wheel....R. C. Stutsman
Tires, Device for locating and determining punctures in pneumatic....J. Lenderyou
Tires, Vulcanizer for repairing....C. E. Miller
Tobacco-moistener....J. F. Leeper
Tobacco-stick....J. H. Grogan
Tool, Combination-....R. T. Bond
Tool-handle....C. W. Layton
Tool-holder....E. B. Sellew
Tooth, Artificial....T. Fintoff
Tray, Sectional stacked letter-....G. and O. D. Collis
Truck clamp, Soap-....F. H. Hotchkiss
Truck, Hand-....J. C. Moore
Truck, Rigger's....J. Ross
Truss....J. A. Anderson
Tube-perforating apparatus....C. Thibodeau
Type-writer, Front-strike....C. Spiro
Type-writing machine....A. W. Smith
Type-writing machine, 4 pats....O. Woodward
Type-writing machine....B. E. McSheehy
Type-writing machine....W. J. Barron
Umbrella-frame....W. E. Van Deventer
Undergarment....W. P. Walker
Unhairing-machine....M. A. Powers
Unit form-holder....B. E. McSheehy
Valve....E. M. Sturgis et al
Valve and valve-box, Shower-....J. A. Wilson
Valve, Automatic....J. G. Banjock
Valve for air-compressors, Air-, 2 pats....J. G. Leyner
Valve for steam boilers and pipes, Reversible cut-out....J. Erwood
Valve-operating mechanism, Hydraulic turbine-....C. Beale et al
Valve, Train safety cut-out....G. H. Wilson
Vaporizing-burner....H. J. D. de Sales
Vehicle....W. N. Snow
Vehicle-brake....J. G. Miller
Vehicle-brake, Railway and road....J. E. Schumacher
Vehicle, Motor-....R. Ruemelin
Vehicle running-gear....L. B. Hart et al
Vehicle-wheel....E. Fishburn
Vehicles, cabs, cars, and the like, Apparatus for recording numbers of....C. Willse
Vehicles, Safety device for occupants of....R. Radtke
Ventilating device....C. Stein
Ventilator....A. M. H. de Bruycker
Vessel for whale-fishing....J. A. Mörch
Vibrator....G. B. Pickop
Wagon-box....J. B. Pospeshil
Wagon, Dumping-....J. W. Hobson
Washing-machine support....F. M. Sinclair
Washing-machines, Operating-gear mechanism for....J. Edens
Water-closet seat....L. Oppenheim
Water or other liquid from mineral, vegetable, and animal substances, Extraction of....B. Schwerin
Water-purifier....J. Bowey, Jr.
Water-wheel....R. A. Fontaine
Web-press plate-cylinders, Clip for....F. E. Ellis et al
Wedge, Ax or tool....G. P. Morrill
Well drill, Deep-....W. Hutchings
Wheel tread or tire, Rubber....E. B. Killen
Wood, Impregnating....J. Rütgers
Woodwork, Concealed fastener and joint in....D. L. Tschantz
Wrapping machine, Package-..T. C. Hook et al
Wrench....J. Haugland et al
Wrench....J. M. Bott

DESIGNS.

Badge....B. M. Branson
Glass vessel....C. S. Whipple
Type, Font of....S. C. Gaunt
Watch-fob....R. J. Stokes

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MECHANICAL PATENTS.

Abrasive composition....A. F. Dreesen et al
Accordion, 2 pats....H. Hohner
Accordion, Mouth, 2 pats....M. Hohner
Adding-machine....J. G. Vincent
Advertising device....A. S. Leupold
Advertising device....C. M. De Forest
Aerophore....L. de Forest
Air-brake system....W. T. Crumpler et al
Alarm....E. Pfeifer
Alarm-whistle....J. Gordon, Jr.
Animal-trap....M. M. Berg
Apparel-hanger....F. N. Kershaw
Apparel-rack....C. L. Wood
Arrester....A. B. Chance
Arsenic trioxid, Preparing....U. Wedge
Automatic gate....L. P. McVay
Automobiles and other vehicles, Folding shield for....F. Jackson
Badge....L. P. Wickland
Bag....I. J. Levy
Bag, parcel, and box fastener...F. H. Sterling
Bailing-press automatic bale-wiring mechanism....R. C. Redpath
Basket-making-machine attachment....S. L. Casella
Batteries, Means for charging storage....W. D. Stivers
Bearing washer, Ball-....V. Crouch
Beater, Mechanical liquid-....A. Ovidi
Bedstead, Metal....J. C. Scott
Belt....F. R. Batchelder
Belt, Conveyer-....A. W. Walton
Belt-fastener....F. M. Linderman
Billiard-cue....A. K. Hanson
Binder, Loose-leaf....A. Chronik
Blinds to spring-rollers, Means for securing..J. L. Thompson
Bloom-handling means....F. B. Uncapher
Boat attaching and detaching device....J. R. Raymond
Boiler superheater, Steam-...W. Ackroyd et al
Boiler-tube-cleaning apparatus..H. F. Weiland
Boilers, Fuel and water controlled apparatus for flash-....J. W. and O. U. Chenoweth
Boring-machine....W. D. Price et al
Bottle capping machine....T. J. Levey
Bottle-closure....C. Hammer
Bottle, Non-refillable....H. L. Mitchell
Bottle-retaining device for ice-boxes....N. B. Haskins
Bowsprit-chock....C. D. Durkee
Box....J. Nutry
Brake-shoe brace....W. J. N. Aldridge
Branch block....H. R. Sargent
Branding apparatus....E. T. Nicklin et al
Bridge, Bascule-....J. B. Strauss
Broom and like holder....A. S. Weller
Broom, Dust-laying....L. G. Anthony
Broom-holder....L. E. Higgins
Brush, Dust-....C. Johnson
Bucket, Clam-shell....F. W. Lovell
Buckle....J. Maltby
Buckle....I. Blum
Building-light....P. Schwickart

Burglar-alarm....V. D'Incognito
Burner....T. J. McGee et al
Busline coupling-socket....G. H. Hill
Buttoner, Shoe-....D. Crane
Cable-hook....W. C. Terry
Calculating-machine....G. H. Sears
Camp table and chest, Combination....J. B. Huston
Can cap, Tin or other metal....E. H. Taylor
Candy-package....H. O. Whyman
Cane, Musical....D. A. Lohr
Caoutchouc, Production of pure..A. Foelsing
Car-coupling....G. C. Harlin
Car-coupling, 2 pats....W. F. Richards
Car-door....S. W. Wigner
Car-fender....G. W. De Clements
Car safety-guard, Street-...A. A. Brokenhagen
Car-seat....C. K. Pickles
Car-switching....F. N. Wonderlin
Car, Tank-....C. A. Shoemaker
Car-tarpaulin....S. G. Stevens
Cars and other vehicles, Resilient wheel of motor-....T. Oldfield et al
Cars, Dumping-door-operating mechanism for dump-....E. Posson
Carbureter, Explosion-engine....A. A. Louis
Carbureter for internal-combustion engines....J. Johnston
Carbureters, Air-intake regulator for....F. C. Reineking
Card-feeders, Automatic stock-compensating device for....G. F. Geb
Carousel....A. Kolsky
Carton....L. G. Reynolds
Carts, Device to prevent horse motion in....W. N. Cleveland
Cash-register....J. P. Cleal
Casting apparatus, Ingot-....J. O. E. Trotz
Ceiling....F. Abel
Cement-block machine, Down-face....G. F. Newton
Cement clinkers, Method and apparatus for utilizing heat from....T. C. King
Cement-wall mold....J. W. Alexander
Chain-connecting link....S. Nelsen
Check....E. Kimber
Check-controlled mechanism....T. V. Skelly
Cheese-cutter, Computing....J. H. Osborne
Cigar-holder....G. A. T. Walker
Clamp-rib for ironwork....T. M. Worcester
Clasp....L. Parenti
Clothing-carrier, Extension....N. F. Purcell
Clutch....D. E. Dolson et al
Clutch Friction-....E. Bauroth
Coal-dumping cage....H. O. Pearce
Cock, Gage-....C. A. Daflinger
Coffee-pervolator....H. W. Reynolds
Coking hydrous bituminous combustibles....P. Hoering
Collar, Horse-....T. G. Hadaway
Collar pad, Horse-....C. F. Hickman et al
Color-meter....F. E. Ives
Column support and fastener, Porch-....J. M. Daugherty
Commercial instrument....E. Kimber
Concrete-block-molding machine....W. H. Phillips
Concrete cross-tie, Reinforced..J. H. Bowditch
Concrete-mixing apparatus....A. von Siller
Concrete pipe....C. Meriwether
Contactor, 2 pats....G. H. Hill
Controlling device....W. P. Kidder
Conveyer-bucket....G. W. Barnett
Coop and crate....G. Heim
Corn-cutter knife....A. W. Thomas
Corn-popper, Double-acting....F. B. Rennick
Corset....H. H. Treffer
cotton-chopper....S. Vance
Cotton-chopper....J. W. Allen
Cotton-ginning machinery....J. B. Cornwall
Crank stitching-machine....J. Schroeder
Crate shipping-case, Egg-....C. H. Cronk
Crucible-furnace....E. Rankin
Culinary vessels, Adjustable support for....J. J. Keen
Cultivator....L. E. Waterman
Cultivator attachment....J. W. Warner
Cultivator-bail....L. E. Waterman
Cultivator replanting attachment...E. Palmer
Cultivator-shovel spring mechanism....A. C. Walter
Cup-handle....A. N. Cooper
Curd-agitator, Automatic....I. W. Hogue
Currycomb....W. G. Stone
Curtain-fixture....H. E. Keeler
Curtain-stretching pin....G. K. Reid
Cuspidor....M. G. Melvin
Cyanid-tank....R. S. Browne
Cycle-Motor-....C. Contal
Damper, Stove-....J. Beahen et al
Deck-traveler....H. P. Thorn
Designs, Machine for making....E. I. Horsman, Jr.
Desk attachment....C. E. Ashley
Dining-table and settee, Combined....I. J. Weinberg
Door....E. G. Budd
Door-hanger tracks, Supporting-bracket for....T. C. Prouty
Door-hanger wheel....T. C. Prouty
Door, Locker-....R. W. Jefferis
Door-securer....J. G. Bins
Door-securer....E. Weber
Door stop and holder....J. Wallace
Draft-regulator, Automatic...J. J. McKernan
Drill-socket....N. E. Woods
Drills or bits, Manufacture of...L. D. Brown
Drinking-trough....M. Brown
Drying apparatus....J. A. McKee et al
Drying device....R. Woerner
Dyeing textile fibers, Preparing water used in....G. Sanders
Ejector and ventilator, Automatic....L. Lagna-Fietta
Electric generator or motor....C. L. Kennedy
Electric machine, Dynamo-....H. G. Reist
Electrical-distribution system....O. O. Kruh
Electrode, Accumulator-....L. Strasser
Electrode for electrolytic or liquid oscillation-detectors for wireless telegraphy....L. de Forest
Electromechanical device....G. H. Rowe
Elevator....T. B. Bennett et al
Elevator mechanism....J. Baum
Engine....J. Munden
Engine-cylinder....W. Giebfried
Engine indicator, Steam-....G. A. Webster
Engine sparking device, Explosive-....C. R. Greuter
Engine valve, Blowing-....H. Hamkens
Evaporator....T. Suzuki
Excavating apparatus....C. E. Wyman
Explosive compound....G. Schultz et al
Explosive-engine....L. R. O'Neill
Fabrics, Machine for hemming sacking and other....W. R. Barcklow
Fare-register....W. I. Ohmer
Fastener....C. G. Turner
Faucet....A. W. Wheaton
Feed-bag support....J. H. Byron
Feed-water heater....R. C. Casperson
Feeder or conveyer mechanism....N. B. Converse
Fence-post....J. H. Hufford
Fences, Device for securing pickets to wire....S. Wharton
Fender....C. K. Wehn
Fertilizer-distributer....R. L. Graves
Field-glasses, Folding....J. B. Kissner
File-clip....R. M. Vick
Filtering apparatus....E. J. White
Filtering device....M. G. Melvin
Fire-alarm box....L. G. Woolley
Fire-extinguisher....N. P. Matlock
Fire-extinguisher, Chemical....W. A. Harland
Fire-extinguishing compound, Antifreezing....M. Breslauer
Firearm, Slaughter-house....G. L. Derriman
Fireproof door....P. Ebner
Fish-trap....E. F. Dollar
Flat-bed and rotary press, Combined....H. F. Bechman
Flier....S. J. Bastien
Flue-cleaner....G. W. and E. L. Rucker
Flush receptacle and plug....F. W. Sanford
Folder or envelop....J. E. Blaine, Jr.
Fudging-machine....S. A. Krewson
Furnaces, Apparatus for charging....H. A. Prosser et al
Furniture, Collapsible or folding..H. Raymond
Fuse box and receptacle, Combined....H. R. Sargent
Galvanizing sheet metal....C. Lebert et al
Game apparatus....J. G. Seiler
Game apparatus....J. Chaboty
Gapes, instrument to cure....E. J. Funk
Garden-shears....W. Selley
Garment-hanger....W. M. Jones
Gas and gasolene engine....A. Fricker
Gas-burner....C. B. and T. White
Gas-engine....F. C. Avery
Gas generator, Water-....H. N. Cheney
Gas-hose safety device....B. Leyh
Gas-purifying apparatus....H. F. Smith
Gases, Apparatus for absorption....G. Eschellmann et al
Gate....D. Fasold
Gate....F. Bohne
Gear, Change-speed....J. Johnston et al
Gearing and brake mechanism, Transmission-....H. F. Maynes
Gearing, Changeable-speed....W. Scott
Gold separator and amalgamator....C. H. Hall et al
Grain-drill....W. T. Edwards
Gum-liquid coating to covers, Machine for applying....J. Schiönning
Gun, 2 pats....B. W. Punches
Gun single-trigger mechanism....R. F. MacMichael
Guns, Means to prevent crosin in....B. C. Winslow
Hair-roll....T. P. Taylor
Hair-roll, Aseptic....L. E. and M. M. Renth
Handling express matter, &c., Apparatus for....C. M. Medairy
Harrow, Gang disk....H. Christensen
Harvesting machine, Vegetable-....A. G. Ellinwood
Hasp-fastener....M. D. Mansur
Hat, coat, and umbrella rack, Combined....J. Crozier et al
Hat-frame machine....A. E. Hoermann
Hay-press....D. Confer
Heating and ventilating device....T. Jaap
Hinge....N. Gudeman
Hinge, Gate-....F. W. Kalsow
Hoisting apparatus....J. D. Austin
Holster....F. R. Batchelder
Hooks and eyes to ribbon, Cards, &c., Machine for attaching....W. M. Corthell
Hoop-bending machine....J. R. Hardman
Horse releaser....G. W. Hurst
Hose-coupling....M. Cani
Hose-leak stopper....D. G. Kitzmiller
Hydraulic machinery....H. A. Higgins
Hydraulic main....A. Seeley
Hydraulic motor....C. P. Johnson
Ice crusher and elevator....A. V. Culver
Igniter, Self-....R. E. Berthold
Indoxyl, &c., Making....A. Bischler
Induction-coil....A. R. Bliss
Inkstand....O. M. Giersing et al
Insect-killer....E. E. Reynolds
Inspirator....C. F. Starre
Instrument for comparing and measuring rays of light....C. G. Hinrichs
Insulating electric conductors....J. T. H. Dempster
Insulator....T. E. Hallett
Insulator and wire-clamp....J. L. Fay
Iron in the manufacture of steel, Purifying cast-....W. Muirhead
Ironing machine, Shirt-....C. T. Gilmore
Jar-closure....J. P. Lyon
Jar opener, Fruit-....R. J. Givens
Joining-table....J. F. Nolan
Journal-bearing adjustment....C. Reeves
Journal-box....J. A. Duffy
....J. B. Rhodes
Key-duplicator....W. R. Corbin
Labeling-machine....F. W. Wild, Jr.
Lamp-fastening clamp....R. H. Welles
Lamp, Incandescent....W. W. Dean
Lamp, Incandescent....E. G. Gilson
Lamp, Miner's....A. Brile
Lamps, Means for operating vapor electric....E. Weintraub
Land-roller....F. L. Gaines
Lantern....F. A. Satter
Lantern-frame....A. H. Handlan, Jr.
Last....J. Dion
Lathe, 2 pats....F. Hardinge
Leach-clearing device....W. Ferguson
Leaf, flower, or spray stand, Folding....H. R. Harvey
Leather-buffing machine....H. A. Holder
Leather, Composition for making artificial....H. Lewis
Leg-brace....W. H. Ford
Lifting-jack....F. I. Joyce
Lightning-arrester....M. Milch
Liquid-flow controller....S. Vivian
Liquid-purifying apparatus, Electrolytic....J. T. Harris
Liquids, Treating comminuted solids with....A. Adair
Loading apparatus for wagons and the like....L. Kniffen
Loom for the manufacture of tufted pile fabrics, Power-....C. and A. Renard
Loom, stop-motion....F. Mitchell et al
Loom weft stop-motion, Wire-..F. L. Trudeau
Looms, Cloth-controlling mechanism for....A. and S. Widmer
Lubricating device....C. J. Pihl
Lubricator....J. M. Chambers
Lumber-kiln....J. McLaughlin
Magneto-electric generator..L. A. Gianoli et al
Mail-bag apparatus....P. Woitynek
Mail-bag catcher and deliverer....L. Waldeck
Mail-bag catching and delivering mechanism..E. Henner et al
Mail-box....A. Bessner
Mail-chute-securing device....J. W. Cutler
Mail-chutes, Locking device for the removable sections of....J. W. Cutler
Mail-crane....C. C. Hagmann et al
Mail despatcher and receiver, Combined....J. E. Carter
Mail-receptacle....M. S. Field
Manure-spreader....C. L. Dyk
Match-box....C. W. Oertel
Match-box and cigar-cutter, Combined..E. Ciner
Mattress-filling machine....E. Zofnass
Measure, Foot-....F. A. McGowan
Measuring instrument....W. M. Wood
Meat, &c., Machine for grinding....S. Olop
Mechanical lubricator....J. Suess
Metal-cutting instrument....C. Delcampe
Metals and relieving them of injurious strains, Raising the elastic limit of....A. H. Emery
Meter....C. E. Holmes
Milk pasteurizer and regenerator..H. E. Jones
Mill feed apparatus....S. Snyder
Milling-machine....R. K. Le Blond et al
Mining-machines, Chain-link for....D. Buel
Mirror, Shaving-....D. J. McIsaac
Mold....R. B. Tufts
Moldable mass or compound articles of manufacture and forming same....C. H. Land
Mop-head and wringing attachment..S. J. Bugh
Motor control system....W. J. Richards
Motor control system, Electric-..R. M. Gaston
Motor-controlling system....W. J. Richards
Mowers, Ball-bearing adjustment for lawn-....A. B. Case
Multiphase systems, Regulation for....E. Schildhauer et al
Musical instruments, Pneumatic-action for....E. A. Steel
Nitrous compounds, Apparatus for manufacturing....C. P. Steinmetz
Nut-lock....E. R. Parkhurst
Nut-lock....D. L. Appelberry
Nut or bolt lock....B. E. Norris
Oil-burner, Stove....F. W. Horton
Oil-burning and steam-generating apparatus...W. N. Best et al
Oiling device for pressure-fluid motors....J. A. Vincent
Onion gathering and topping machine....A. E. Lundy
Ore-jigger....E. Cohen
Ores by means of the precipitation process, Treatment of....A. H. Imbert
Package for confections and other small articles....J. K. Farley, Jr.
Package-tie....J. J. Hughes
Packing, Metallic....G. D. Rollins
Packing, Metallic....S. Barnett
Packing, Rod-....T. A. Johnston
Packing-strips, Machine for cutting....J. J. Fearon
Pail, Paper....H. H. Stonebarger
Paint and rust removing machine..C. E. Grant
Paint-sprayer....H. Mikory
Paper box....M. M. Rollestone
Paper-coating machine....M. Cantine
Paper machine, Wall-....N. M. Purviance
Paper-trimming machine....C. Seybold
Pattern draft or chart....H. P. Jacobson
Pavement-protector....C. E. Fullerton
Peanut-digger....J. T. W. Rushton
Pen, Fountain....H. G. Mills
Pen, Fountain....C. W. Knapp
Penholder, Nib-ejecting....H. E. Catlin
Pencil and pen holder, Pocket..R. C. Kruschke
Pencil, Lead-....W. B. McKim
Pencil-sharpener....F. O. Porter
Pencil-sharpener, Automatic...L. B. Chadwick
Permutation-lock....J. Baum
Permutation-lock....M. B. Mills
Photographic films, Machine for exposing and developing....G. C. Beidler (Reissue.)
Photographic pictures from a height, Apparatus for taking....G. B. Seele
Photographic-plate-holder slide....L. Borsum
Photographs are desired to remove discoloration, &c., Coating objects of which..T. W. Smillie
Piano-player attachment....C. E. Pryor
Pianoforte action, Upright-....J. Deleruc
Picture-hanger....E. Fleming
Pipe-joint....J. A. Brodin
Pipe-wrench....O. F. Glidden
Pipes or the like, Inlet box or gully for drain-....F. Niemeier
Pistol, Repeating....H. A. Bierley et al
Pitchfork....J. C. Frees
Plant-table....A. Elder
Plating-machine....S. C. Catlin
Plow....E. B. James
Plow, Lister-....A. Shearer
Plow pulverizer attachment....W. Olson
Plow, Wheeled....L. E. Waterman
Poke, Animal-....C. C. Bush
Pole-support....L. E. Waterman
Porcelain-ware-molding apparatus....H. Geisenhöner
Portable heater and radiator....W. W. Frantz
Posts and poles, Sterilizing and preserving....H. P. Folsom et al
Power-changing mechanism..R. Symmonds, Jr.
Power-translating apparatus....J. Sachs
Precious metals from ores, Extracting....I. Kitsee
Press-feeding attachment, Semiautomatic....L. C. Krummel
Primary battery....E. G. Dolge
Printers' plate clamps, Tool for moving ... of....H. B. Ro...
Printer's rule and lead cutter...H. B. R...
Printing machinery....S. G. G...
Printing-plate....K. Geiser et ...
Printing-plate holder, 2 pats....W. J. K...
Printing-press....H. F. Be...n
Printing-press attachment....A. L. S...
Printing-press roll-holder....H. P. H...y
Propelling device, Boat-....J. A. Walker
Protective device....E. Schlatter
Pull-support....J. D. Campbell
Pulley-line tightener....J. H. Bowers
Pump, Pneumatic....A. Brost
Pumping and generating apparatus, Hydraulic....E. R. Brodton
Punching-machine feed mechanism....A. Rinderer
Purse or bag frame....B. vom Fign
Pyrites briquets, Making..P. D. Ricketts et al
Pyrites fines for desulfurization, Preparing....P. D. Ricketts et al
Quill-feeding device for automatic machines....W. Webster
Rack....G. H. Schubert
Rail-bonds, Forming....E. M. Bournonville
Rail-chair....A. Haarmann
Rail-fastener for metallic ties....R. O. Bixby
Rail-joint....O. P. Hanson
Rail-joint....G. W. De Graw
Rail-joint....D. D. Wright
Railway, Electric....M. A. Lazarus
Railway safety appliance....M. E. Hogan
Railway safety appliance....C. A. Ward
Railway signaling....J. B. Struble
Railway switch mechanism....L. Roach
Railway-switch-operating mechanism....P. J. Glancey
Railway systems, Contact switch-box for electric-....C. A. Huse et al
Railway-tie....C. E. Barnum
Railway-tie....J. McGranighan
Railway tie and rail fastening....J. U. Beatty
Railway-tie, Metallic, 3 pats....J. G. Snyder
Ratchet mechanism....G. O. Leopold
Ratchet-wrench....A. J. Higbee
Rear-sight....W. L. Marble
Refrigerating apparatus....H. Rassbach
Registering and counting machine, Automatic....J. M. Johnson
Rein-holder....E. R. Fuller
Retaining-comb....I. O. Lofstrom
Rheostat....W. C. Yates
Rheostat....P. H. Zimmer
Rheostat....G. H. Dorgeloh
Rheostat, Starting-....W. C. Yates et al
Rifle-sight....E. R. Sneddon
Riveting, Blind....J. D. Karle
Road-machine....T. R. McKnight
Rock-drill....H. I. C. Keymer
Rod or wire working machines, Tubular stock-spindle for automatic....H. B. Lester
Roller-skate....J. Hohenadel
Rotary engine....J. W. von Pittler
Rotary engine....B. Dahl
Rotary explosion-engine....W. H. Fulton
Safe, Screw-door....C. E. Blechschmidt
Safety-pin....H. H. Taylor
Sand-blast apparatus....A. Jorn, Jr.
Sash balance and lock....A. S. Bradley
Sash-lock....F. W. Barber et al
Sash lock and tightener....H. O. Wolff
Scale, Wagon-....J. F. Hinck
Scraper, Foot-....W. W. Lincoln
Screen frame and joint....F. E. Schumacher
Seal-fastening....T. E. Murray
Secondary or storage battery....C. H. Clare
Seed tester and propagator....L. A. Kaump
Semaphore-signal....W. W. Brown et al
Sewed articles, Seam for....W. Arbetter
Sewing-machine....J. Diehl
Sewing-machine binder attachment....J. Taiz
Sewing-machine, Blindstitching....C. Scudder et al
Sewing-machine take-up mechanism..J. B. Farr
Shaft-coupling....A. Hitchon
Sharpener for Self-feeders, Knife-....D. E. Ringland
Shell, Metallic....F. C. Sanford
Shoe and making the same....W. R. Green
Shovel dippers, Separable tooth for power-....A. O. Anderson et al
Show-case....W. C. Bowser
Sidewalk-door....W. E. Snaman
Sighting appliance, Illuminating..W. H. Wright
Sign....H. Christensen
Sign-board....A. O. Johnson
Signaling apparatus, Wireless....L. De Forest
Siphon....W. P. Locke
Sleeve-holder....M. Kuze
Slicer, Potato-....D. E. Poche
Smelting iron ores....E. D. Kendall
Snap-fastener....G. A. Holmes
Soap-holder, Safety....P. E. Royal
Soap-partitioning table....E. P. Pullen
Solder-feeding mechanism....H. K. Smith
Soldering-tool, Wireman's..P. A. Cassidy et al
Spirometer....J. A. Morris
Spring-wheel....H. Neubert
Square, Box-....W. A. McCormick
Square, Center-....S. C. Hills
Stack-forming mechanism....G. Marshall
Staircase soffit structure....E. E. Schachner
Steam-radiator heater, Portable..W. R. Kinnear
Stiffening device....W. W. Johnson
Stilt....J. F. McCormick
Stone-cutting machine....J. E. Gravell
Stopper extractor, Bottle-....J. F. Jones
Stove....O. Brizard
Stove and range, Cooking....R. N. Grundy
Stoves, Supplemental downdraft for....E. M. Hitchcock
Stovepipe-thimble....W. B. McLean
Strip-serving device....S. Elliott (Reissue.)
Stump-puller....C. E. C. Edey
Submarine jacket....L. Y. Spear et al
Suspenders....J. Bustanoby
Swage....E. D. Castle
Swimming-glove....A. A. Brenton
Switch....B. G. Watkins
Switch-operating mechanism....A. C. Tunison
Switch-points, Adjustable connection for....W. F. Bossert
Switch-register, Electric....I. H. Jackson
Tag....H. P. Cannon
Tag manufacturing machine....A. Dansereau
Tamper, Rolling....G. Ross et al
Tank-heater....A. Neusus et al

Tank-indicator....J. E. Smith
Tannin extract and producing same....F. J. Maywald
Target-trap....P. J. Hindmarsh
Telegraphy....I. Kitsee
Telephone apparatus, 2 pats....A. M. Cobb
Telephone-transmitter....E. J. Pitrat
Tent, Folding....J. F. Miles
Test apparatus....H. W. Trott
Thresher, Traveling....A. Hovland
Tile....J. W. Farr
Timepiece-regulator....O. Ohlson
Tire armor or protector....C. Filler
Tire-protector holder....F. O. Slanker
Tire protector, Pneumatic....R. A. Mason
Tobacco-pipe, 2 pats....D. Bruce
Toll-collecting box....G. A. Long
Tongs for fixing eyes and hooks....E. H. T. Strömbäck
Tongs, Rail....J. E. Collins
Tongue support, Wagon....H. P. Huddleston
Tool, Hand....G. E. Wood
Tool-rest, Adjustable....A. M. McLeran
Toothpick-stand....J. Sahlin
Toy, Educational....T. E. Lockwood
Transformer....J. J. Frank
Transmission mechanism....C. S. Batdorf
Trap-nest and poultry-coop, Combined....C. Weeks
Trenches in paved streets, Machine for opening....J. M. Hendron
Tripod....C. N. Leonard
Trolley-base....C. M. Stokes et al
Trolley-contact....L. A. Hawkins
Trolley-guard....G. S. Keck
Truck, Car....E. Peckham
Truck, Hand....M. W. Neuens
Tubes and gaskets, Apparatus for mounting and dismounting....J. Merritt
Turbine....A. C. Toms
Turbine bucket-wheel....E. Kallberg
Turbine-governor....A. C. Toms
Turbo-generator....A. H. Wouters
Type-writer....E. L. Wood
Type-writer cabinet....L. B. Walker
Type-writing-machine ribbon mechanism....J. W. Kennedy
Umbrella, Folding....C. R. Wheeler
Valve and valve construction....W. M. Fulton
Valve, Flush....J. W. Kennedy
Valve for air-brake systems, Automatic pressure-retaining....J. D. Nichol
Valve for compressed-air-operated dump-cars, Engineer's....T. R. McKnight
Vehicle....G. Simon
Vehicle-cushion, Pneumatic....E. A. and C. A. Garvey
Vehicle, Electrically-propelled....J. Ledwinka
Vehicle gearing, Motor....F. Beemer
Vehicle shock-absorber....E. A. and C. A. Garvey
Vehicle-spindle....T. T. Thompson
Vehicle-wheel....H. M. Martin
Vehicle wheel, Road....J. Slee
Vehicle-wheel....G. H. Gruss
Vending-machine....J. Vierling
Vending-machine....E. F. Blodgett et al
Veneer-press, Knockdown....D. S. Ackley
Ventilating-panel....F. E. Richardson
Voltage-regulating system....W. L. Merrill
Voltage transformer, Variable....M. G. Young
Wagon brake, Hay....O. Wooten
Wagon-rack, Adjustable....G. B. Mills
Waist and skirt supporter, Combination....T. Kennell
Warping-machines, Electric stop-motion for....F. Ott
Washboard for washing-machines, Flexible....C. Case
Watch, Stop....G. Klumak
Watches, Washer for case-screws for....C. E. Cashmore
Water-closet....P. Haas
Water-gate....A. A. Taylor
Water-heater....S. Turansky
Water-heater, Electric....F. E. Holt
Water-heater, Instantaneous....J. M. Horner
Water-main-cleaning device....J. Maslin
Water-wheel, Turbine....M. A. Replogle et al
Waterer, Stock....W. H. Morris et al
Weaner, Calf....J. W. Rykard
Well apparatus, Oil....L. W. Brown
Wheel rim, Vehicle-, 4 pats....E. C. Shaw
Wheel specially adapted to receive an auxiliary or spare rim....T. M. Davies
Winding-machine....J. H. Lendi et al
Windmill device....H. N. Cox
Window and porch jack combined....W. B. Stoops
Window-lock....O. Graichen
Winker-brace clip....J. H. Schaaf
Wire bails to paper boxes, Machine for forming and applying....C. D. Grimes (Reissue.)
Wire-coating machine....J. G. Callan
Wire- Manufacture of covered....C. V. Ackerman
Wire-stringing device....J. G. Callan
Wooden boards in strips, Device for embossing and cutting....F. A. Sass
Wrench....J. Johnson
Writing and marking device....J. A. Enright
Writing-machine....E. B. Hess

DESIGNS.

Electric cut-out holder....T. E. Murray
Emblem....L. J. Fox
Match-box support....L. T. Savage

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MECHANICAL PATENTS.

Abrasive finishing-machine....D. S. Oakley
Acid, Manufacturing barbituric....O. Wolfes
Adding-machine-stand caster....A. Hendricks
Advertising device....R. Streich
Advertising device....H. A. Goeb'er
Air, Apparatus for treating and heating....G. E. Hesse
Air-compressor or vacuum-pump....E. Gaucher
Air-liquefying apparatus....J. F. Place
Air, Treating and heating....G. E. Hesse
Amalgams or alloys, Producing....C. F. Carrier, Jr.
Amusement apparatus....E. F. Quaintance
Animal-trap....O. F. Lund
Animal-trap....W. C. Hooker
Armature-bands, Apparatus for applying....R. E. Manley
Automatic filter-press....E. H. Alvord
Automatic player....G. W. Paulson
Automobile water-radiator....C. F. Schell
Awning-fastening, Separable....J. R. Sullivan
Awnings, Means for operating roller-....N. Roe
Axle-box lid, Car-....H. I. McMahan
Axle, Car-....M. H. Bullard
Baler division-block, Hay-....H. N. and W. C. Ellis
Baling-press....C. Clark
Baling-press....H. C. Betts
Bank-calendar holder, Savings-....A. Shepard et al
Bank, Portable savings-....A. Shepard et al
Bar-hook-clamping device....F. Schraudner
Beams, &c., tensioning device, Warp-....A. Brunelle
Bearing for vehicle-wheels, Ball-....L. Burg
Bed-bottom....C. Vallone (Reissue.)
Bed-seat, Convertible....T. F. Harris et al
Bedstead, Sofa-....H. C. Aiken
Bell mechanism, Door-....A. R. Pool et al
Belt-clamp....W. H. Gilbert
Belt, Safety-....L. L. Hull
Billiard and pool table, Combined....R. Schneider
Blind, Window-....D. I. Andrews
Blowing-engine or compressor....G. B. Petsche
Boiler-furnace....J. S. Roake
Boilers, Apparatus for removing sediment from steam-....P. Hulburd
Bolster....H. Aiken
Book, Pocket check-....F. C. Rhodes
Boot and shoe....W. Gordon
Boot and shoe....H. Z. Angevine
Boot or shoe....E. S. Morris et al
Bottle-cap....H. S. Brewington
Bottle-closure....R. T. Hapgood et al
Bottle-filling apparatus, Revolving....A. A. Pindstofte
Bottle-sealing machine....A. L. Weissenthanner
Bottling machine, Beer-....J. G. Hehr et al
Box-lifter....S. W. Gunnison
Bracelet, bangle, ring, &c....P. Döppenschmitt
Brake-actuating-lever mechanism....R. H. Bowman
Brake-beam....C. F. Huntoon
Brake-block....H. Frood et al
Brake-rigging....W. G. Price
Brush....E. Miltner
Brush-holder....J. B. Schultz
Brush, Self-feeding shaving-....H. F. Hansell, Jr. et al
Brush, Shaving-....W. Jay
Bucket, Automatic....S. E. Atherton
Buckle....H. W. Zinn
Buckle....R. O'Neill, Jr.
Buckle, Suspender-....J. J. Buchanan
Buckle, Trace-....N. P. Nystrom
Buffing-machine....A. Bates
Buggy-box....J. C. Roth
Building, Rotary....T. F. Gaynor
Button....J. Niederer
Cabinet....H. Abrahamson
Cabinet....J. H. D. Everett
Cabinet and pasty-board, Combined spice-....W. Flanders
Cable-grip....W. J. Selleck
Cable-hanger....J. D. E. Duncan
Cake-mixer....A. Tomlinson
Cake-turner....S. S. Eccleston
Cane-mill....A. F. Delbert
Car....B. F. Brumaghim
Car body truck, Detachable....G. W. Lettinger
Car-body center-bearing....L. J. Berg
Car-brake systems, Connector for railway-....G. E. Kelly et al
Car-cleaning apparatus, 2 pats....H. M. Turner
Car-controlling apparatus....A. W. Reiling
Car-coupling, Automatic....A. Churcher, Jr.
Car door, Grain-....O. Nelson
Car for electric motor-vehicles, Trolley-....R. Arno et al
Car friction drive mechanism, Motor-....C. C. Keyser
Car, Gondola....G. I. King
Car-loader....W. E. Hunt
Car, Mine-....A. S. Gustafson
Car-seat....E. G. Budd
Carbureting apparatus....H. Keitel
Card or ticket holder....J. Black
Cartridge-cases and similar articles, Manufacture of....S. O. Cowper-Coles
Carving-machine....W. F. Mangles
Cash-register or like machine printing mechanism....A. J. Postans
Casting apparatus....S. G. Franklin
Casting chilled rolls, Mold for, 2 pats....R. H. West
Cement medium compound....C. H. Land
Cement-treating apparatus....O. Gerlach
Certificate, Validation-....J. H. McCameron
Channeling-tool....J. C. Mercer
Check delivering, registering, and alarm device....J. W. Jones
Chuck, Drill-....P. Lonergan
Churn-dasher....T. S. Gill
Cigar-case....J. Langfeld
Cigar-crimper....C. G. Singley
Circuit-breaker, Automatic magnetic....W. M. Scott
Clothes-hanging clip....A. Schöning
Clothes-rack....J. B. Baum
Clutch....A. Bornefeld
Clutch, One-way....F. A. Warren, Jr.
Coal unloading and distributing apparatus....G. M. Bennett
Coaster, Amusement-....P. Gourdon
Coaster-brake and speed gearing....W. S. Gubelman
Coffee-urn....A. E. White
Colander....A. M. Desprez
Color-book, Combination-....J. M. Bacon
Comb....J. L. Combis
Commutator....W. T. Hensley
Concrete-block press....E. S. Redmond
Concrete construction- member, Reinforced....R. Anderson
Concrete-conveyer....J. W. Buzzell et al
Concrete curb-block, Interlocking....S. L. Davis
Conveyer for granulators....W. R. Warren
Conveying apparatus....T. S. Miller et al
Cooking utensil....A. M. Nicodemus
Copper, Electrodeposition of....S. O. Cowper-Coles
Copper from ores, Recovering....W. B. Potter
Corset....A. J. Lecoutre (Reissue.)
Cotter-pins, Device for applying and removing....W. C. Jaegle
Cotton-chopper....A. W. Smith
Cotton-chopper....L. D. Gresham
Cover-fastening means....G. P. Smith
Crate, Egg-....J. Weis
Crate, Portable pie-....C. J. Herrmann
Cream-separator....W. L. Dillman
Cream-separator liner, Centrifugal-....D. R. Green
Crematory....F. P. Smith
Crucibles, &c., Treating....W. R. Mitchell
Cultivator....G. W. Spragins
Cultivator....C. F. Vermillion
Cultivator....W. A. Dromgold
Cultivator and harrow, Revolving....H. P. Bruaas
Cultivator attachment....J. E. Wright
Cultivator, Wheeled....W. S. Graham
Current generator, Induction-....M. Fischer
Current meter, Alternating-....E. Morck
Curtain, Berth-....S. H. Brown et al
Cushion....E. G. Budd
Cuspidor-support....N. V. and L. Mango
Cut-out for indicating means, Automatic....A. B. Herrick
Cutter-blade holder, Inserted-....J. R. Whittemore et al
Cutter-head, 2 pats....C. Johnson
Cutter-head for suction-dredges....B. A. Anderson
Delivery apparatus for dry goods....J. Kunz
Dental face-bow....J. H. Prothero
Directory, Building-....F. Fleming
Directory, Telephone-....A. Wilt
Dish-drainer....M. E. Brockman
Disinfecting apparatus....V. A. Williams
Dispensing and measuring apparatus....C. and P. Dacosta
Display-easel....J. E. Twitchell
Door-hanger....J. H. Burkholder
Door-lock, Combination....D. E. Lombard
Door-stop....J. P. Sévigny
Drill and socket therefor....H. Derrer
Drill driving-gearing, Upright....A. E. Newton
Dry battery....G. M. Wheeler et al
Drying, baking, and roasting apparatus....P. C. Donner
Dust-collector....S. W. Keys
Dust-collector....A. C. Bartlett
Duster, Feather....A. C. Isham
Dye and making same, Friable vegetable....F. J. Maywald
Dyeing-machine....J. Hussong
Dynamite or other explosive heater....B. F. Kelly
Electric-circuit load-equalizer....J. S. Peck
Electric circuits, Method of and apparatus for controlling....O. Rothenstein
Electric machine, Dynamo-....W. T. Hensley
Electric switch....J. T. Cooper
Electrode for the evolution of ozone from oxygen or atmospheric air....J. R. Craig, Jr.
Electrolysis to scouring and squeezing machines, Application of....J. M. J. Baudot
Electromechanical movement....G. H. Davis
Elevator safety device....J. W. Beach
Energy recovering, transforming, and conserving mechanism....L. Dion
Engine revolutions, Means for indicating and recording marine-....E. Amodeo-Salvator
Engine starting device, Explosion-....H. C. Bailey
Ensilage-cutter....T. Ponsar et al
Envelop, Quick-opening....W. D. Smith
Equalizer....A. V. and D. M. Baker
Eraser-cleaning apparatus, Blackboard-....H. G. Berkeley
Erasing instrument....I. Lucas
Excavating apparatus....L. Bree
Expansion-block....L. Caputo
Explosion-engine....T. J. E. Molden
Explosion-engine, Multiple-cylinder two-cycle....A. Winton et al
Explosive....C. Girard
Eyeglass-hook....S. J. Clulee
Fabric-pasting machine....W. J. O'Donnell
Fan, Steam-....R. L. Darter
Fence, Iron....F. A. Peter
Fence machine, Wire-....G. E. Mirfield
Fence-tie....C. E. Birch
File, Bookkeeping-....C. E. Leer
File for prints, Dust-proof....C. Potter
Files, Device for lifting documents, &c., off....A. Heydemann
Filter....A. E. Chapman
Filter-cleaning system....H. W. Blaisdell
Filter, Oil-....J. H. A. Gardiner
Filter-sand-....J. M. K. Pennink
Finger-ring-marking machine....H. Henrich
Fire-starter....G. H. Fisher
Firearm with drop-down barrel....F. Stendebach
Fishing-rod....J. E. Hostetter et al
Flexible coupling....R. L. Lowry
Flour-oxidizing apparatus....W. L. Jones
Flower-pot....M. W. Uban
Flue-cleaner....L. C. Rogers
Fluid-pressure automatic governing mechanism, Constant-....F. H. Brown
Fruit-box....E. B. Weston
Furnace attachment....R. G. Speer
Furnace circulatory system....B. L. Worthen
Furnace-roof....W. Sleicher
Furnace-roof....F. Milliken
Furniture....L. Faust et al
Furniture-buffer....J. A. Vogel
Gaff-hook, Folding....J. M. Thomson
Game-board....J. H. Trant
Garbage-incinerator....W. H. Van Doren
Gas-engine....C. Burgess, Jr.
Gas-engine....W. L. Morrow
Gas generator, Acetylene-....A. W. Hanger
Gas-producer....M. E. Crowell
Gas-purifier....E. Theisen
Gas-valve, Safety....F. Yockey et al
Gate....G. W. and C. E. Goss
Gate....J. W. Matthews
Gear-case....P. Fray
Gear connection, Resilient....N. W. Storer
Gearing, 2 pats....A. E. Newton
Gearing, Compensating....D. E. Ross
Glass-tank furnace....J. Schies et al
Globe, Geographical....H. Harger
Globe-operating mechanism, Geographical-....J. L. Hughes et al
Go-cart runner....J. B. Simmons
Goggles, Automobile-....P. C. M. Montbarbon
Golf-club....F. W. Brewster
Grader, Road-....E. Lee
Grading machine, Road-....P. J. Jewett
Grain-meter....J. S. Blakely
Graphite-separator....W. M. Fuller
Gun and projectile therefor....J. H. Brown
Hammock, Berth-....W. E. McPherson
Handle-fastener....M. F. Mobr
Harness....E. B. Guerin
Harness-loop....A. W. Kreuter
Harrow....C. Washington
Harvester-reel....G. F. Beal
Hay and stock rack, Combined....W. C. Skinner
Heat-controlling device....W. M. Fulton
Heat-regulator....G. L. Hopping
Heating-system attachment....E. H. Gold
Heel, Boot and shoe....J. W. Walker
Hinge, Shipping-can....H. N. Backus
Hitching and releasing mechanism for animals, Combined....G. Schrepfer
Hog-hanger....H. E. Barlock
Hoist, Spring-....W. Van Wie
Hoist, Traveling....V. O. Strobel et al
Hoop....J. G. Marsh
Horse-releasing apparatus....C. C. Rich
Horseshoe....H. V. Drown et al
Horseshoe....F. A. Harden
Hose and pipe coupling....W. Pohlman
Hydrant....G. A. Owen
Hydrocarbon-burner....W. H. Callihan
Incubator-alarm....R. Johnson
Incubator-partition....A. McEwan
Internal-combustion engine....J. C. Peache
Internal-combustion engine....O. Kelly
Internal-combustion engine....C. R. Radcliffe
Iron-foundry mixing-furnace....J. S. Kennedy et al
Jar cover, Fruit-....S. J. Vasaly
Journal-box....A. H. Lewis
Labeling-machine....F. H. Knapp et al
Lamp, High-power....T. J. Litle, Jr.
Land-roller....A. Beier
Lantern, 2 pats....F. K. Wright
Lathes, Change-speed gearing for engine-....A. E. Newton
Lawn-edge trimmer....J. G. Himmelsbach
Leather-splitting machinee....F. J. Nash
Leather-working machine....I. G. Levin
Letter-clip....C. A. Locke
Letter-opening machine....M. Heilbron et al
Level and plumb-rule....W. W. Stettler
Leveling device....C. A. Benson
Leveling-rod....W. H. Jones
Lifting and lowering apparatus....J. V. Vicksell
Liquid-fuel burner....J. A. Willis
Liquid-separator, Centrifugal....E. W. Richmond
Lock....C. E. C. Edey
Locomotive....L. J. Monahan
Loom brake mechanism....F. H. Thompson
Loom picker-stick connection....L. F. Gillespie
Lubricating device....D. K. Allison
Magnetic inductor....M. Fischer
Magnets, Controlling system for lifting-....R. I. Wright
Mail catching and delivering device....M. D. Cummings
Mail catchine and delivering device....R. R. Roth
Mail-delivering device....F. E. Kampmeyer, Sr. et al
Manure-spreader....A. A. Fokken
Mat....T. C. McPherson
Match-box....G. F. Kolb
Mathematical instrument....A. Baur
Matrix or type lines, Spacer selecting and releasing mechanism for use in justifying....B. F. Bellows
Measure....D. Howe
Measuring-machine....C. H. Lantz
Meat-tenderer....S. Armstrong
Mechanical movement....W. Sullivan
Mechanical movement....H. M. Russell, Jr.
Medicinal washes to the nasal cavity, Apparatus for applying....E. S. Antisdale
Metal plates, pipes, &c., Blowpipe for cutting....F. Jottrand et al
Milking apparatus....W. Sinclair
Milling and drilling machine work-support....W. B. Knight
Miner's drill....J. Bleser
Mixing or separating machine....F. Ecaubert
Moisture-absorber....D. F. Morgan
Molding-machine....F. W. Hall
Mop-wringer....W. H. Wetmore
Motor-control system....C. D. Gilpin
Motor-controlling device....F. D. Hallock
Motor for washing-machines, &c..R. Rainalter
Mouse-trap....W. C. Hooker
Mower, Lawn-....J. H. Holland
Multiple cluster-socket....C. D. Gervin
Music-rack....J. P. Sesseman
Music, System of instruction in the pronunciation of foreign words in vocal....C. Thurwanger (Reissue.)
Musical-instrument attachment, Keyed-....J. Parduba
Musical-instrument key, Stringed-....J. T. Standing
Musical instrument, Pneumatic mechanical....G. P. Brand
Musical instrument, Stringed-....F. Nusekabel
Musical instruments, Pneumatic for keyboard....R. H. McHardy
Nail-cabinet....J. D. Leen
Necktie-securing device....D. Zaiden
Nitrils of aromatic alpha-oxyacids, Preparing....J. L. Turner et al
Nut-lock....L. P. Schramm
Nut-lock....W. Brown
Nut, Locking-, 3 pats....A. V. Bryce
Ore-concentrating table....E. Deister
Ore-concentrator, 3 pats....E. Deister
Ore-concentrator feeding device....E. Deister
Ore, Treating....J. H. Reid
Ores, Minerals, &c., Apparatus for the concentration of....J. C. Greenway
Oven, Baker's....J. Middleby
Oxygen-generator....A. Beltzer
Package-tie....W. A. Hayes
Packet-tying device....C. L. Jackson
Packing....G. R. Noble
Packing....O. Otto
Packing, Rod-....O. J. Garlock
Pane-securing means....N. Fells
Paper and letter holder....A. D. Albrecht
Paper-machine suction-roll....W. H. Millspaugh
Paper-making-machine reel....E. J. Pope
Paraffining-receptacle device....E. C. Copper
Paste or cake of deflocculated material, Preparing....E. G. Acheson
Pencil holder and sharpener, Combined....E. E. Hopkins
Pencil sharpener, Lead-....A. W. Mueller
Perforating slips for telegraphic signaling, &c., Means for....M. Kotyra

Photographer's background-carrier.....H. Tomlinson
Photographic appliance...F. C. Bradburn et al
Photographic objective.....P. Rudolph
Photographic-printing-apparatus attachment....H. H. McIntire
Photographic sensitized plates, Means for the daylight loading and unloading of.....R. R. Allen
Pianos, Pneumatic valve-action for player-....J. Wieser
Picture-hanger.....J. N. Copeland
Pipe-clamp.....O. S. Augensen
Plaster, Corn and bunion.....P. S. Bauer
Plastic compositions from fibrous materials, Manufacture of.....N. Reif
Plate-handler.....R. Brooks
Plate-lifter.....A. C. and C. L. Miller
Plow.....A. L. Van Valkenburgh
Plow.....J. C. Messer et al
Plow, weeder, and grubber, Surface.....G. L. Stookey et al
Poultry-feeding device..W. M. and R. M. Cox
Poultry-roost.....C. W. Kriedler
Powder-dividing and capsule-filling apparatus.....L. G. Taylor
Power-transmitting means.....E. J. Fountaine
Power-transmitting mechanism...A. E. Newton
Printer's chase.....J. E. Bright
Printing apparatus, Stencil-.....D. Gastetner
Printing-machine.....A. McPherson
Printing machine, Measuring-tape-...E. Eigner
Printing machine, Street-.....D. Landau
Printing-ribbons, Renewing process for.....J. R. Gallagher
Protractor and parallel-ruler, Combined.....C. J. H. Grant
Pulp-classifier.....A. G. Kirby
Pump piston, Air-.....T. R. Green
Pumping system, Two-phase.G. C. McFarlane
Puzzle.....T. Scrutchin
Puzzle.....C. B. Rosenberger
Rail-bond.....A. B. Herrick
Rail-chair.....H. P. Ellerbeck
Rail-joint.....O. Scanlan
Rail-joint.....B. S. Gillum
Rail-joint.....O. O'Neal
Railway-car draft-rigging.....W. Yost
Railway, Electric.....J. Mayer
Railway-gate.....A. Spies
Railway-signal.....Z. E. Williamson
Railway-signal, Electric..A. W. McMaugh et al
Railway-track joint.....J. Wisner
Range lighter, Gas-.....P. A. Johansen
Rat-trap.....T. L. Smith
Razor, Safety-.....R. H. Reed
Reamer, Adjustable.....P. E. Johanson
Reciprocating motion, Mechanism for producing.....A. L. Waugh
Reciprocating motor.....I. Yassenoff
Registering device.....A. E. J. Luckhurst
Road, and street clearing machine, Land.....J. von Bertouck
Roll-protector.....C. J. Rothermel
Roller-skaters in rinks, Supporting apparatus for.....C. A. Spooner
Rope-clamp.....W. A. Boulter
Rope-clamp.....B. Brazelle
Rotary engine.....F. Rossbach-Rousset
Rotary engine.....J. Beuc
Ruler.....H. J. Kimmel
Ruler, Antiblotting-.....M. W. Alexander
Running-gear.....W. M. Hargrove
Sad-iron.....A. L. Eccles
Sadiron, 2 pats.....H. E. Asbury
Safe.....W. E. Arnold
Sash-hanger.....J. W. Cooper
Sash-lock.....A. N. Porter
Sauer-kraut, Desiccating.....J. R. Hare
Saw-guide.....H. J. Kiger et al
Saw setting and sharpening machine.....J. F. Bond
Scale.....J. L. Theobald
Scale, Weighing-.....J. H. and A. McLeod
Seal, Mechanical.....F. P. Pfleghar
Search-light for submarine observation.....A. L. Farr
Seating.....H. S. Hale et al
Seed-distributer.....V. G. Guthrie
Seed-testing apparatus.....D. W. Miner
Seeder attachment.....J. W. Hunze
Self-players, Pneumatic action for.....F. B. Long et al
Self-regulating separator.....O. Boyer
Separator.....J. H. Rector
Sewage, Treating.....C. C. E. Beddoes
Sewing-machine.....C. A. Dearborn
Sewing-machine buttonhole-sewing attachment.....C. E. Ongley
Sewing-machine guiding attachment for edging.....R. G. Woodward
Sewing-machine welt-guide, Welt-, 2 pats.....W. Thompson
Shade and curtain adjuster, Window.....R. A. Breitenfeld
Shaft-collar, 3 pats.....H. T. Hallowell
Shaft-polishing machine.....J. S. Griffin
Sharpener, Sprag-.....J. McDonald
Sheet-metal blanks, Apparatus for flanging, crimping, or otherwise shaping.....F. Brückmann, Jr. et al
Shipping-case.....N. A. Smith
Shock-absorber.....J. A. Scott
Shoe-sole support.....J. W. Arrowsmith
Silk, Ungumming raw.....P. Schmid
Slicer and cutter, vegetable and fruit.....J. A. Childress
Slicer, Vegetable-.....C. E. Wagner
Slicing-machine.....I. Heller
Slicing-machine.....W. A. van Berkel
Snap-hook.....M. Pike
Snap-hook.....J. F. Lyman
Snow-plow.....A. S. Cerkez
Sound reproducer and recorder.....A. Junod
Spark-arrester.....W. A. Gooch
Spark-arrester.....H. A. Hurtienne
Spark-plug.....J. Lang
Spark-plug.....W. L. Ash
Speed mechanism, Constant-....A. H. F. Schaar
Speed-meter.....C. J. Stuart
Speed transmission, Variable-.....H. H. Cutler
Spike.....A. Eisenreich
Spinning and twisting machines, Underclearer or "fluker" for.....T. D. Williams et al
Spinning wheel, Pottery-.....C. D. Weeks
Spoke-tightener.....J. L. Zane
Spring-lid box.....J. R. Sundlee
Sprinkler system, Automatic...G. I. Rockwood
Square, Carpenter's.....P. J. Cooley
Square, Try and bevel.....E. H. Horton
Station-indicator.....B. R. Skinner
Steam power and heating apparatus, Combined.....E. F. Osborne
Sterilizers, Making.....A. Engle
Stirrup, Elastic.....B. F. Nagle
Stitch-separating machine.....J. B. Hadaway
Store goods litter.....I. T. Lee
Stoves, Air-heating attachment for.....G. W. Smith
Street-cleaning machine.....F. Rogowski
Street tarring sanding machine.....W. C. Southgate
Striping device.....G. E. Duval
Stropping-machine.....J. Lorenzen
Stump-puller.....J. Lynch
Subaqueous foundation.....A. F. Eells
Superheater.....E. D. Meier
Surgical appliance.....W. C. Yates
Suspenders.....A. Schad
Switch-stand.....W. W. Allen
Table.....J. A. Tysklind
Table lock, Pedestal-extension-...C. S. Burton
Tack and staple puller.....C. H. Miles
Talking-machine.....M. Samuel
Tap and reamer, Collapsible taper-thread.....W. W. Vosper
Telegraph system, Multiplex...A. W. Douglas
Telegraphic and telephonic impulses simultaneously, Receiving.....I. Kitsee
Telegraphy.....P. B. Delany
Telephone system.....W. W. Dean
Tension-guide and thread-cleaner.....W. J. English
Theatrical property.....M. Fortuny
Tie-plate.....M. Sellers
Timepiece compensating controller.....F. Ecaubert
Tin and terne plates, Automatic plate-carrier for use in the manufacture of.....T. James
Tire.....A. G. Ritchie
Tissues or flies and attaching them to boxes, Machine for making.....A. Kingsbury
Tongue attachment, Vehicle-...C. D. Williams
Tongue-support.....N. Kessler
Tool-points, Means for attaching.....E. E. Hendershot et al
Tool, Pneumatic.....T. Donohoe
Torpedoes, Gyroscopic steering-gear for.....F. M. Leavitt
Toy.....H. Stubert
Toy, Mechanical.....T. A. Killman
Tracker-board.....H. Pierce
Train-order-delivery-apparatus.....E. E. Sappenfield
Train-order holder and deliverer...J. J. Metz
Transom-operating mechanism.C. F. Harrington
Trolley.....L. W. Campbell
Trolley-catcher.....G. Gessert
Trolley-guard.....C. H. Yarrington
Trolley-pole, Automatic collapsing and reërecting.....G. S. Thomson
Trolley-pole for electric vehicles, Reversible and collapsible.....J. and R. Lindsay
Trolley-pole mount.....E. H. Burnes
Truck, Car-.....S. P. Bush
Truck, Combination-.....E. Willer
Truck, Locomotive rear swing-....K. Rushton
Trucks, Folding platform for operators of motor-.....T. V. Buckwalter
Turbine.....J. Kadiera
Turbine, Fluid-pressure.....G. Westinghouse
Turpentine, Purifying.....H. O. Chute
Twine knotter and cutter, Hand...A. Larson
Twisting-machine.....E. Stickler
Type-writer ribbon for use in lithographing...W. F. Clarke
Type-writing machine.....J. Hinklein
Type-writing machine.....C. W. Brown
Umbrella-rib.....M. G. McGuire
Undergarment.....C. H. Little
Universal joint.....M. E. Blood
Valve.....W. J. Kennedy
Valve.....J. F. Robertson
Valve.....W. H. Russell et al
Valve and valve-casing.....C. G. Sprado
Valve, Blowing-engine inlet-...M. A. Neeland
Valve, Boiler feed-.....G. W. Collin
Valve, Exhaust-.....F. H. Chisholm
Valve for air-compressors, Eduction-.J. Rogers
Valve, Graduating release-.....J. W. Cloud
Valve, Reducing-.....G. W. Collin
Valve-setting machine.....R. E. Wylie et al
Valve, Thermostatic.....A. F. Ames
Valve, Water and air relief-.....A. Harrison
Vehicle running-gear.....G. M. Phillips
Vehicle-wheel.....N. Schenk
Vehicle-wheel.....G. G. Trannoy
Vehicles, Electric suspension for.....C. L. Le Duc and L. Garchey
Vessel for conveying materials.....R. Jonas
Voting-machine.....A. McKenzie
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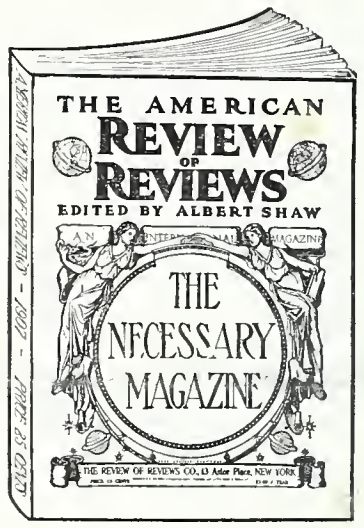
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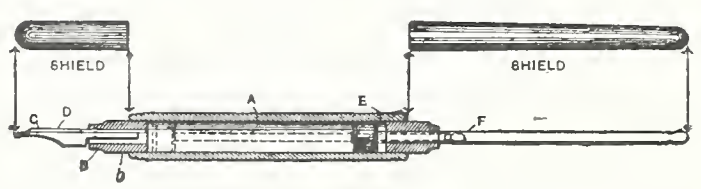
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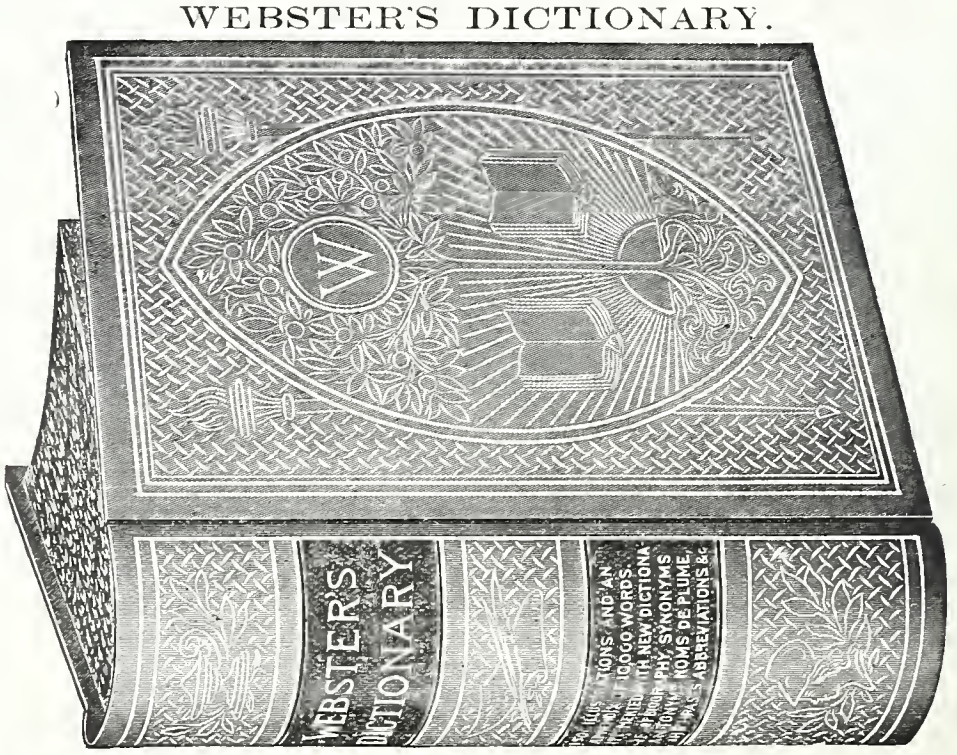


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LAYING A TELEPHONE CABLE IN DEEP WATER.

By E. OMMEGANCK.

CONSIDERING the large number of submarine telegraph cables in use, it may be a matter of surprise that there are so few telephone cables. Special difficulties are met with, however, in the laying of the submarine telephone cable. Owing to its construction, the telephone cable has greater capacity and smaller inductance than a land line of corresponding resistance and length. In order to obtain clear speech, however, there should be small capacity and high self-induction. Where there are no insulation troubles, the two conditions may easily be combined. For submarine cables gutta-percha has generally been considered the best insulating material, in spite of its high price and its great inductive capacity. Vulcanized rubber may be used, and has indeed answered in a few of the submarine cables of the early days. But rubber is not generally trusted; and air space and paper insulation (so useful and convenient in many instances, and of small inductive capacity) are difficult of application in submarine cables, because a suitable impervious sheath must be provided, which will also bear a great water pressure.

If it were not for these mechanical difficulties, the experiments of Pupin would long ago have paved the way to submarine telephone cables. Pupin showed that by adding self-induction to the line at intervals, the range of clear speech can be greatly increased. The inductance can be increased by enlarging the copper core, when the capacity will likewise rise. This arrangement was tried in cables laid years ago in Europe. Fine iron wire wound directly on the copper core was found to add to the inductance. The iron wire was not insulated from the copper, which was varnished.



STEAMER WITH CABLE SHIP IN TOW.

In all these cases, however, the depth of the water did not exceed 134 feet. A new problem arose in laying the Lake Constance cable. The depth of the open lake portion between Wurtemberg and Switzerland is 820 feet, and considerable difficulties were encountered, although the length of the cable is only seven and a half miles. This is the first submarine telephone cable on the Pupin system, the self-induction by means of coiled iron wire being arranged at intervals of six-tenths of a mile. The cable comprises seven complete circuits.

As the water pressure is 25 atmospheres at a depth of 840 feet, experiments were made as to the strength of the cables, and the pressure was raised to 150 atmospheres, in order to make sure that an apparently harmless pressure might not prove injurious in the course of time. The cables, provided with a double lead sheath one-fifth of an inch in thickness, were all crushed; a pressure of 50 atmospheres would flatten out, in two hours. cables which had borne that pressure quite well for half an hour. The ordinary armoring could not prevent the crushing; but a remedy was found by coiling a steel wire of 0.08 inch thickness in a spiral round the paper insulation, the spirals being one-fifth of an inch or more apart. It was desired to divide the insulation into water-tight sections by inserting impervious portions between the inductance coils. Originally the cable was made in lengths of 1650 feet, and either an inductance coil or a section insulator was alternately interposed between the different lengths. These parts were thicker than the cable itself. The iron-wire coil formed a cylindrical portion of larger diameter: a section insulator formed a doubly conical piece. The armoring was continuous all

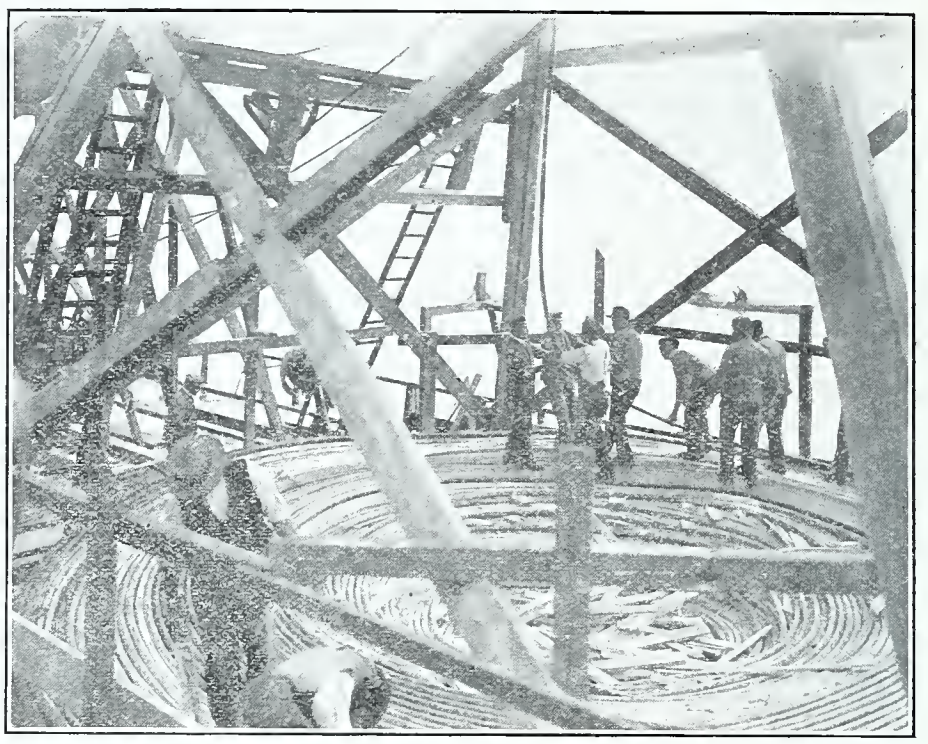
over the cable, and over those thicker portions.

The inductance, as noted, is formed by iron wire, coiled in alternating sections round three or four of the seven pairs of lines. The coil itself is cylindrical; the larger diameter of this cylinder being brought down to the smaller diameter of the cores by two conical portions, which act as waterproof seals between different cable sections. The lead sheath is, in the conical portion, supported by a conical wire spiral, and the paper insulation is replaced by gutta-percha.



LAYING THE TELEPHONE CABLE.

The cable-laying machine (see cuts) was mounted, together with a raised wooden cable conduit, on a boat which was fastened alongside a steamer. The drum of the cable ship was 8 feet in diameter. The cable was successfully laid in two hours. After the cable was landed, tests were continued for twenty-four hours before the splice between the shore end and the land cable was effected. The laying of the telephone cable in Lake Constance has been costly, but it is now known that submarine Pupin cables can be made, and how they are made, and the same expenditure will not apply to future work.



COILING THE CABLE SMOOTHLY ON THE DECK OF THE CABLE-LAYING SHIP.

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Mechanics are generally unable to sketch anything in perspective, and this is probably due to the fact that they constantly see working drawings of machinery, and no other representations of it; yet perspective or pictorial work is where free-hand drawing is most valuable to the mechanic. Without perspective, or without some representations of more than one side of an object, a drawing is not readily and effectively descriptive to the untrained eye. If mechanics could get hold of the simple principles of isometric projection, it would help them much in making intelligent sketches of machinery. The difficulty of drawing ellipses does not apply to free-hand drawing at all, because it is just as easy to draw an ellipse by hand as it is a circle, and perhaps a little easier. The book explains the principles of isometric projection so that ordinary workmen will not be afraid to use it every day in their practice, if they chose to do so.

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This book in no way conflicts with the purposes of other books on telephony, either of encyclopedic character or of less pretentious scope. It is intended for the amateur, the wireman, or the engineer, who desires to establish a telephonic communication between the rooms of his home, office, or shop; between his house and shop; between his home and the homes of his friends; or between his shop and some distant building. It is also for the contractor who desires to do this work for others, or who wishes to build a small exchange in factories, mills, or small towns.

The reader is assumed to know absolutely nothing about telephony, and no intricate mathematics are used, nor is mention made of any apparatus or systems which are not thoroughly illustrated and described with respect to their construction, installation, wiring, operation, and maintenance.

The equipment and the methods of wiring illustrated, have been selected with great care from those which have been in use for a sufficient length of time by the Bell and Independent companies to prove their practical value and become thoroughly standardized.

Electric Stove.

Electric cooking may be made possible in every household, should the experiments now being made by a Johns Hopkins professor prove to be of practical value. A few years ago this professor invented a new type of electric furnace, that excelled in practicability and in the height of the temperature produced. This furnace has now been so improved that it can be used for cooking. The heat can be regulated to within less than one degree, and the desired temperature can be maintained at a constant point indefinitely.

The furnace possesses domestic advantages that are to be found in none of the ordinary modern ranges. There is no feeding with coal, no necessity for caring for the range, and no possibility of spoiling the dinner. The one disadvantage of the furnace is the fact that the cook will be obliged to experiment to find the exact degree of heat required for various articles of food. To remedy this, the professor is making experiments to determine the values of different foodstuffs, and the temperatures at which they must be prepared to obtain the best results, with a view to publishing a treatise on the subject. This will give such exact details that it is said a child can cook an elaborate meal.

One practical use of the furnace, says the Baltimore *News*, will be the establishment of a central supply station with powerful dynamos for the production of the necesary current, which will be distributed to various dwellings. The cook will merely have to prepare the food for cooking, look in the book and see the required heat and time, set the hand on an indicator at the desired degree and throw on a switch. After the period has elapsed the circuit can be broken and the food removed from the oven perfectly done. Housewives will hail this emancipation from toil, and the new stove will also prove a boon to dyspeptics, as the vagaries of the ordinary range are done away with.

Artificial Pavements.

All forms of bituminous pavements, whether manufactured from natural or artificial asphalt, are in fact artificial stone pavements. The industry started in Switzerland, from natural rock asphalt which was mined to extract bitumen for use in medicine and the arts. It is a limestone, impregnated with bitumen, of which it yields from 8 to 14 per cent. It was observed that pieces of rock which fell from a wagon and were crushed beneath the wheels, gradually formed a good road surface. A macadam road of asphalt rock was then made, which gave very good results, and finally compressed asphalt on a concrete foundation came into general use for streets in cities.

PNEUMATIC WHEEL SKATE.

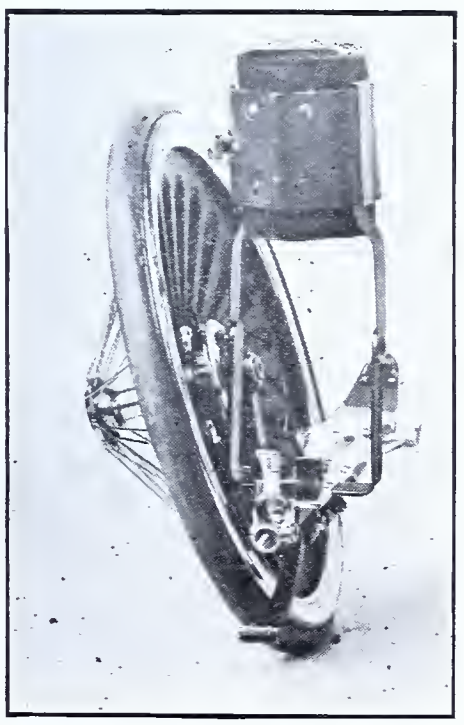
By Frank C. Perkins.

A Swiss inventor has recently designed an interesting form of wheel skate with pneumatic tires. The wheels are about 12 inches in diameter and are arranged for operation in a slanting position, being fastened to the skater's feet somewhat below their



WHEEL SKATE.

centre. This support is somewhat similar to that of an ordinary roller skate or ice skate, while an iron brace is provided on each side of the leg with a strap between the ankle and knee. The wheels are of corrugated metal, stiffened by the addition of a number of tension spokes.



WHEEL SKATE, SHOWING BRAKE.

It will be seen from the illustrations that a novel and effective brake has been provided, with brake block bearing against the wheel rim on the inner periphery. This brake is automatically set, in case the wheel starts to reverse, but under ordinary conditions of forward motion is out of action, although it can be set when desired.

By raising the toe, an arm back of the left heel is brought in contact with the pavement, to act as a drag or additional brake to retard the skater's movement on a hill, or in emergency. For special quick action, a brake block has been provided on the wheel for the right foot having a drag arm similar to that on the left foot just described, the brake block in this case bearing against the inner periphery of the wheel.

A radical proposition of the inventor is the use of a small gasolene or alcohol motor in connection with the wheel skate, the power being transmitted from the engine shaft to a grooved pulley on the wheel by means of a belt. The alcohol or gasolene is conveyed on the skater's back in a small tank, which holds enough to carry him long distances with little effort on his part.

Glass Houses.

Those who live in modern glass houses need not heed the old warning to refrain from throwing stones, for the walls, in spite of the apparently fragile substance of which they are built, are so strong that an ordinary stone would rebound from them without cracking any of the masonry. Nor should people object to living in a house on the ground that anyone can see through its walls as the glass bricks of which they are composed can be made opaque or translucent at will. It was the recent demand for hollow bricks and building blocks for construction purposes that led glass manufacturers to put glass bricks on the market, and they promise to be used extensively for novel and artistic effects.

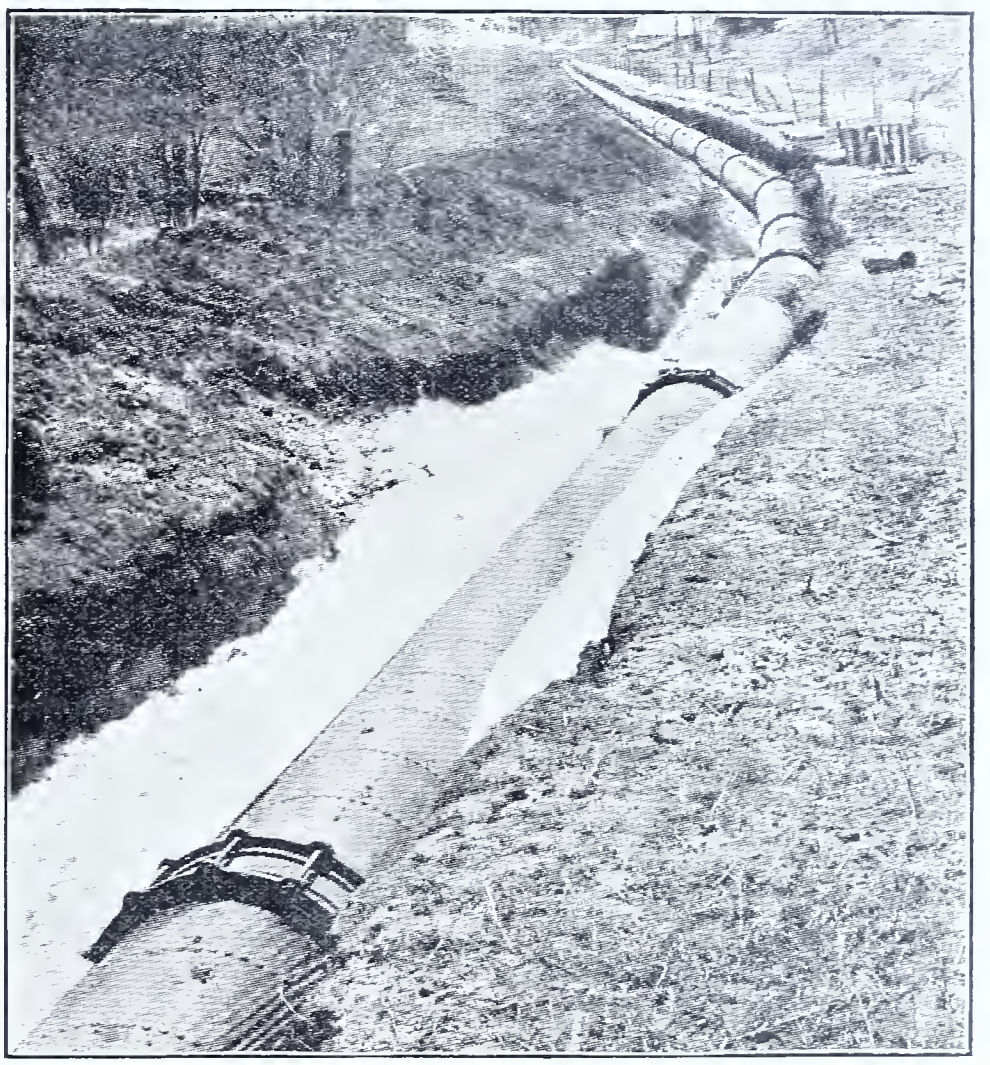
The first glass bricks proved a failure, on account of their cost, but the hollow glass bricks can be made at much less expense. They are lighter and stronger than clay bricks, and are such excellent non-conductors that walls built of them are proof against dampness, heat, cold and sound. The bricks are sealed hermetically when hot, and are placed in walls with a colorless mortar made of special glass. The bonding strength of the glass mortar is almost as great as the bricks themselves. For ornamental friezes, dadoes, and facades they are of special value, and add greatly to the artistic effect.

A Violin-Mandolin.

A new mandolin, which it is said combines the virtues of the violin with those of the parent instrument, and eliminates the faults of both, is being manufactured in Baltimore. The new instrument has the general shape of a mandolin, with frets and fingerboard, but it has a body of violin construction, *i. e.*, the back is all of one piece, there are side pieces, and the belly is curved. The volume of sound produced is very much greater than in the ordinary mandolin—indeed, it has all the vigor and richness of tone of a violin, while the metallic sound caused by the celluloid pick is perceptibly diminished.

SPIRAL PIPES.

Almost every week new things in steel are announced. The cities of the future, it is predicted, will be built of steel. Not only will this material be used to reinforce concrete, but to replace laths and ceilings. The ties of railways, as well as the rails, the cars to carry not alone passengers but freight, are to be made of steel. Steel furniture, steel bathtubs, steel barrels, steel roads, are novelties that will be commonplaces to the next generation. Among the most practical of new developments is the spiral pipe.



SPIRAL PIPE IN USE.

The bursting of pipes involves serious delays and inconveniences in any industry: and a device that can increase their ability to withstand pressure will be welcomed in many directions. Instances are quoted when this pipe has been tested to the bursting point, and the rupture occured invariably in the solid metal, demonstrating that the spiral riveted seam was the strongest part of the pipe. One piece of 12-inch spiral pipe was tested to a hydraulic pressure of 650 pounds per square inch. The result was that the portion between the seam bulged out over three-quarters of an inch, while the seam itself remained unaffected. This is more than the theoretical pressure required to burst a seamless tube, of the same diameter and thickness, made of steel with a tensile strength of 60,000 pounds per square inch. Because of its peculiar mechanical construction, the spiral pipe is said to be from 30 to 50 per cent stronger than other riveted pipes of the same gauge.

In addition to the enormous bursting strength of this pipe, it has exceptional resistance against collapsing under vacuum or heavy earth fills. It possesses great rigidity against bending when carrying heavy loads, so that it is possible to span a considerable distance between supports when necessary. On account of its light weight, making it easy to move, this pipe is coming into extensive use for hydraulic mining and sluicing work.

The illustration shows a line under 220 pounds working pressure, running the water wheel of an hydraulic electric power plant.

Making Cloisonne Ware.

Lovers of art will be glad to learn that the manufacture of cloisonne ware in China has been revived. The process of manufacture, which is complicated, consists first in etching on the copper vessel the design to be followed, and fastening copper wire upon the design by means of a special metallic composition, which will not yield to heat while the vessel is being annealed in the oven. When cool, the vase is scoured in an acid decoction and is ready for coloring. The artist fills in the interstices between the wires with pigments, which consist of crystals with a base of saltpeter and a kind of calcareous sandstone. The colors are obtained by composition with iron pyrites and salts of lead. The powdered crystals, mixed with rice water, form a paste, which is applied with a small trowel. When all the spaces are filled, the vase is again baked, polished with charcoal, and retouched if necessary. It is then ready for gilding, which is done by an ordinary galvanic process, and a final polishing renders the article ready for the market.

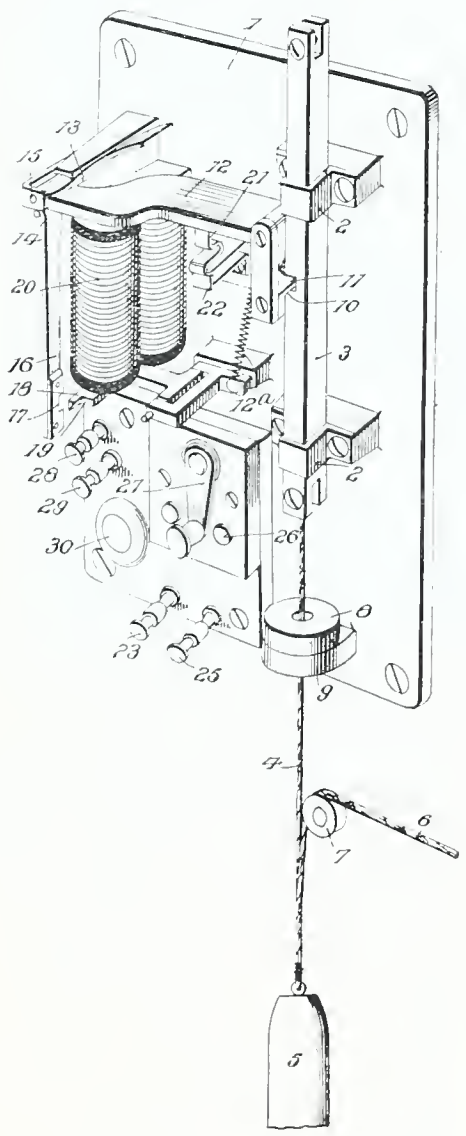
CLEVER NEW PATENTS.

Horse Releasing Means.—Stilt.—Sheet Metal Frame Construction.—Boiler. Display Rack or Stand.

Horse Releasing Means.

Mr. Charles C. Rich, of Mt. Vernon, N. Y., is the patentee of an apparatus for releasing horses and has assigned a one-half interest to Harry J. Douglas, of the same place. This invention has for its object to provide a novel means for releasing horses, and is designed particularly for use in connection with horses of fire-fighting apparatus, although applicable as well for other uses, as is manifest.

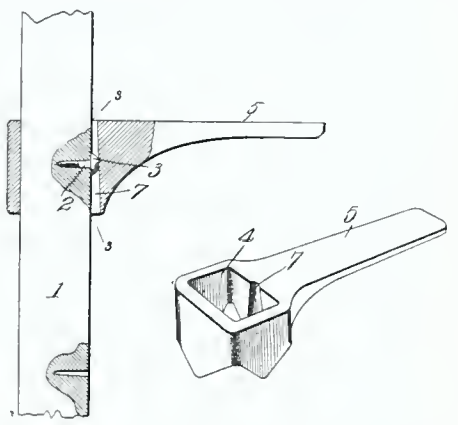
By reference to the accompanying illustration, it will be seen that the invention comprises a gravity actuated drop bar 3, and a dog 12 designed to hold the drop bar 3 in elevated position. A detent lever 14 is designed to engage said dog and hold it in operative engagement with the drop bar, and an electro-magnet 20 is arranged to hold the detent lever 14 in opera-



tive engagement with the dog 12, and is designed to release said lever upon the attraction of the armature by the magnet. Secured to the lower end of the gravity actuated drop bar 3 by means of a cable 4, is a weight 5, which is also provided with a branch cable 6 adapted to pass over a pulley 7 and release the bolt of the stall devices at a distant point, whenever the magnet is caused to release the said bar 3. The terminals 28 and 29 constitute the line terminals of the circuit, and it is intended that from these two terminals or binding posts, wires be led off to an external switch (not shown), which is closed with each stroke of an engine house gong. In the practical operation of the device, the switch 27 is thrown over into contact with the terminal or contact 26. As soon as the engine house gong rings, it is obvious that the circuit through the electro-magnet will be closed, which will trip the apparatus and permit the drop bar 3 to fall, so as to release the horses through the instrumentality of the cables and their connections.

Stilt.

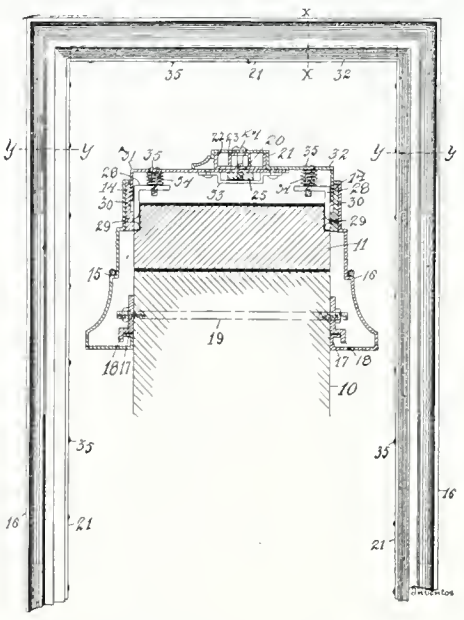
Thomas P. Garretson, of Oskaloosa, Iowa, is the patentee of an improved adjustable stilt, which has for its object to provide a simple means for vertical adjustment of the foot-piece to any desired height on the pole or



support. By reference to the accompanying illustration, it will be noted that the standard 1, preferably formed of wood, is provided on one face with a plurality of perforations 11 adapted to receive a wood screw or pin 2 having a rounded head 3. The step is preferably formed of metal cast in one piece, and provided at one end with a socket 4 of a sufficient size to embrace the standard 1. On the side wall of the socket nearest the step is provided the vertical groove 7, which converges from the base of the socket to the upper end thereof, so that when the screw is in position in one of the perforations formed in the standard 1 and the head 3 flat against the outer face thereof, the wall of the groove comes in contact with the rounded head 3 of the screw 2, which makes further downward movement on the step impossible.

Sheet Metal Frame Construction.

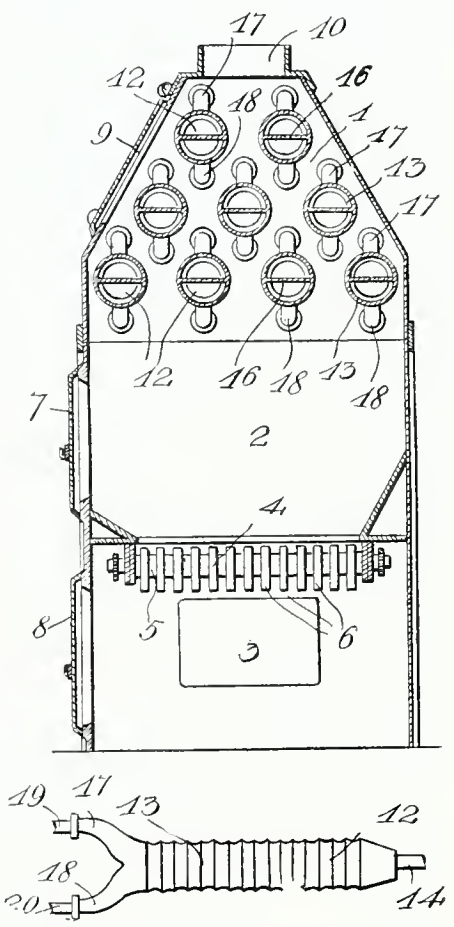
An improved sheet metal frame construction has recently been patented by Enoch Ohnstrand, of Jamestown, N. Y., whose assignee is the Ohnstrand Furniture Co., of the same place. The



invention relates to an improved construction of sheet metal frames, which are particularly adapted for use on walls of fire-proof buildings. By reference to the accompanying illustration, it will be seen that the invention provides a lintel composed of the two outer facings 15 and 16, which are attached at their outer edges by flanges 17 and cleats 18. Angle irons 28 are attached within said facings and are provided with a slot 30. The under face of the lintel is composed of parts 31 and 32, which are provided with flanges that are adapted to enter the slots 30. These parts are attached to the angle irons 28 by the coiled springs 34 and the screw bolts 35. It is apparent that the pieces 31 and 32 may be quickly adjusted by screw bolts 35, and thus accommodate the frame to the settling of the building without buckling or bending the sheet metal casing, thereby spoiling its contour as well as its metal finish.

Boiler.

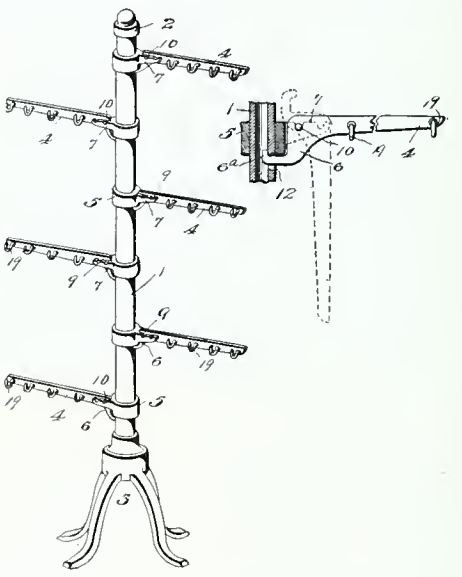
An improved boiler has recently been patented by Charles R. Meres, of Lorain, Ohio, whose assignees are John Maitland and John F. Williams, of the same place. The object of this invention is to provide a steam or hot water boiler having tubes which are adapted to be individually connected with a radiator. By reference to the



accompanying illustration it will be seen that 1 denotes a furnace having a fire box 2 and an ash pit 3. Arranged in the upper portion of the furnace is a series of transversely disposed water tubes 12 which are preferably arranged in horizontal rows. The inlet ends of the tubes are connected to the water supply drums by means of short connecting pipes 14. The discharge ends of the pipes are bifurcated or formed into branched pipes 17 and 18 respectively. Each of these pipes is adapted to be connected to the radiator by supply and return pipes 19 and 20 respectively, and by means of which the steam or hot water from the tubes 12 is circulated through the radiator. By providing a separate heating tube for each radiator and connecting the tube directly thereto, much better results will be attained and a more perfect heat will be provided than is produced in the common form of boiler, in which the radiators are all connected to a single system of pipes.

Display Rack or Stand.

An improved supporting or display rack or stand is the subject-matter of a patent recently obtained by Mark E. Hill, of Washington, D. C., whose assignee is the Collapsible Hanger Co., of the same place. The invention



relates more particulary to racks or stands, which are used for meats, provisions or other articles, and which are adapted, when in use, to support large quantities of material in position for attractive display and immediate access. When the stand is not in use, it can be readily collapsed so as to occupy a very small amount of space. The invention comprises a hollow upright 1 having a series of openings 12 arranged therein. A plurality of collars 5, each having a bracket 7, are arranged to encircle the upright 1. Each bracket forms a bearing for an outstanding arm 4, which is provided with a plurality of hooks, and each of the arms is provided with trunnions 10 adapted to engage with the alined recesses 9 in the upper edge of the brackets. The arm is further provided with an offset extension 6 that is adapted to engage in one of the openings 12 of the upright 1 and retain the arm in a fixed position.

PATENTS, CAVEATS, TRADE-MARKS, COPYRIGHTS, AND DESIGNS. TWENTY-FIVE YEARS PRACTICE.

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

LEEDS & CATLIN CO. v. VICTOR TALKING MACHINE CO. et al.

(Circuit Court of Appeals, Second Circuit. May 2, 1907. 154 F. R. p. 58.)

PATENTS—CONTRIBUTORY INFRINGEMENT—TALKING MACHINES.

A manufacturer of sound records only adapted to be practically used within the United States in a patented talking machine made and sold by another, in which the record disk, while not itself patented, is an essential element of the patented combination, who sells the same to owners of such machines for use therein, is a contributory infringer of the patent.

McCUNE v. BALTIMORE & O. R. CO.

(Circuit Court of Appeals, Third Circuit. May 6, 1907. 154 F. R. p. 63.)

PATENTS—ACTION AT LAW FOR INFRINGEMENT—PROOF OF DAMAGES.

In an action at law to recover damages for the infringement of a patent, where there is no established market value or license fee, general evidence is admissible to show the extent of the plaintiff's damages from the infringement, and he is entitled to show the utility and advantages of the invention over old devices, as a basis from which the jury may estimate the exteut of his loss.

RUMFORD CHEMICAL WORKS v. HYGIENIC CHEMICAL CO.

(Circuit Court of Appeals, Third Circuit. April 26, 1907. 154 F. R. p. 65.)

PATENTS—SUIT FOR INFRINGEMENT—EVIDENCE.

Evidence in a suit for infringement of a patent held insufficient to show that the defendant was privy to a prior suit brought by complainant against others so as to render a deposition taken therein admissible against defendant.

HOGAN v. WESTMORELAND SPECIALTY CO. et al.

(Circuit Court of Appeals, Third Circuit. April 26, 1907. 154 F. R. p. 66.

1. PATENTS — INVENTION ADJUDICATION OF INVALIDITY ON DEMURRER.

A patent should be adjudged void on demurrer for lack of patentable invention apparent on its face only in exceptional cases, where the question is free from doubt.

2. SAME—DREDGE FOR SALT OR PEPPER.

The Hogan patent, No. 752,903, for a dredge for salt or pepper, is not so manifestly devoid of invention on its face as to warrant its being declared void on demurrer to a bill for its infringement.

SHAW STOCKING CO. v. WEIERMAN & SARFERT.

(Circuit Court, E. D. Pennsylvania. June 6, 1907. 154 F. R. p. 67.)

PATENTS—VALIDITY AND INFRINGEMENT—STOCKING.

The Shaw patent, No. 460,037, for an improved stocking and method of making the same, the product being a split-foot seamless stocking, having the top and bottom of the foot knit of differeut yarns and the edges of the parts joined by interlooping stitches, was not anticipated, and discloses novelty and patentable invention; also held infringed.

MARCONI WIRELESS TELEGRAPH CO. OF AMERICA v. AMERICAN DE FOREST WIRELESS TELEGRAPH CO. et al.

(Circuit Court, S. D. New York. April 22, 1907. 154 F. R. p. 74.)

PATENTS—INFRINGEMENT—WIRELESS TELEGRAPHIC APPARATUS.

Infringement of claim 3 of the Marconi reissued patent, No. 11,913 (original No. 586,193), for improvements in transmitting electrical impulses and signals and in apparatus therefor, held in such doubt on the showing made as not to warrant the granting of a preliminary injunction.

AMERICAN LOCOMOTIVE SANDER CO. v ECONOMY LOCOMOTIVE SANDER CO.

(Circuit Court, D. Deleware. May 30, 1907. 154 F. R. p. 79.)

PATENTS—INFRINGEMENT.

Claims 1 and 2 of United States letters patent No. 433,686, granted to Henry L. Leach, Jr., assignor, etc., for track-sanding apparatus for locomotives, sustained, and held to have been infringed.

In re DE FOREST WIRELESS TELEGRAPH CO. et al.

NATIONAL ELECTRIC SIGNALING CO. v. DE FOREST WIRELESS TELEGRAPH CO. et al.

(Circuit Court, S. D. New York. April 30, 1907. 154 F. R. p. 81.)

PATENTS—SUIT FOR INFRINGEMENT—VIOLATION OF INJUNCTION.

The violation of an injunction against infringement of a patent by a defendant held not wilful, where it substituted a device believed to be noninfringing, and the fine for contempt for such violation fixed at the amouut of complainants' damages, costs, and disbursemeuts.

HILDRETH v. NORTON.

(Circuit Court, N. D. New York. June 10, 1907. 154 F. R. p. 82.)

PATENTS—SUIT FOR INFRINGEMENT—PRELIMINARY INJUNCTION.

A preliminary injunction against infringement of the Dickinson patent, No. 831,501, for a candy-pulling machine, denied on condition that defendant furnish a bond; the patent not having been adjudicated nor long acquiesed in.

AMERICAN LOCOMOTIVE SANDER CO. v. ECONOMY LOCOMOTIVE SANDER CO.

(Circuit Court, D. Deleware. June 10, 1907. 154 F. R. p. 83.)

PATENTS—PATENTABLE NOVELTY.

Claims 1, 2 and 8 of U. S. letters patent No. 656,553, grauted to Henry L. Leach, assignor, &c., for "Improvements in Pneumatic Track-Sanders for Locomotives," held void for lack of patentable novelty.

CALCULAGRAPH CO. v. AUTOMATIC TIME STAMP CO. et al.

(Circuit Court, S. D. New York. April 9, 1907. 154 F. R. p. 166.)

JUDGMENT - PERSONS CONCLUDED-PRIVIES.

A decree in favor of the defendant in a suit for iufriugement of a patent brought after the defeudant had beeu succeeded in business by a corporation, is not a bar to a second suit against the corporation which continued the alleged infriugement, but was not made a party to the first suit.

BROOKFIELD et al. v. ELMER GLASS WORKS.

(Circuit Court of Appeals, Third Circuit. May 24, 1907. 154 F. R. p. 197.)

PATENTS—INFRINGEMENT—PRESS FOR MAKING SCREW INSULATORS.

The Kribs patent, No. 542,565, for a press for making screw insulators, held uot infringed.

WARREN FEATHERBONE CO. v. DE CAMP et al.

(Circuit Court, N. D. Illinois, E. D. January 31, 1907. Rehearing Denied May 14, 1907. 154 F. R. p. 198.)

1. JUDGMENT-PERSONS CONCLUDED-PRINCIPAL AND AGENT.

An exclusive sales agent for an article alleged to infringe a patent, who became such agent pending a suit against his principal for the infringement, was in privity with such suit, and a decree therein declaring the patent void is a bar to a suit against him for its infringement, based on his sales as such agent, and commenced while the former suit was still pending.

2. SAME — PLEADING — DEFENSE OF RES JUDICATA.

A defense of res judicata in an equity suit should properly be raised by plea, or where it arises after answer by a supplemental answer; but it may be considered, although raised informally by an amended answer, filed by stipulation of the parties, and to which no objection is made.

RUSHMORE v. SAXON.

(Circuit Court, S. D. New York. February 2, 1907. 154 F. R. p. 213.)

TRADE-MARKS AND TRADE-NAMES — SUIT FOR UNFAIR COMPETITION-PRELIMINARY INJUNCTION.

The right of a complainant to a preliminary iujunction and its scope considered in a suit for unfair competition in imitating a lamp made by complainant.

RUBBER TIRE WHEEL CO. v. MILWAUKEE RUBBER WORKS CO.

(Circuit Court of Appeals, Seventh Circuit. April 16, 1907. 154 F. R. p. 355.)

1. PATENTS—SCOPE OF MONOPOLY GRANTED—EFFECT OF STATE STATUTES.

A state statute caunot interfere with the monopoly granted to a patentee and his assignees under the federal laws.

2. SAME — LICENSES — LEGALITY OF CONDITIONS.

Use of a patented invention cannot be had except on the inventor's terms, and the requirement that a licensee join other licensees in a combinatiou or pool to control the prices and output of an innocuous patented article is not in violation of the Sherman anti-trust act of July 2, 1890 (26 Stat. 209, c. 647, § 1 [U. S. Comp. St. 1901, p. 3200]). Patented articles, unless and until they are released by the owner of the patent from the dominion of his monopoly, are not articles of trade or commerce among the several states within the meaning of such act, because they are not articles in which the people are entitled to freedom of trade.

3. SAME—LICENSE CONTRACTS — LEGALITY.

A system of contracts between the owuer of a patent for rubber-tired wheels and its licensees, fixiug uniform prices and the percentage of the whole output which should be made and sold by each licensee, and providing that the business of all should be supervised by commissioners appointed by the licensor, is not rendered invalid by a provision for the accumulation of a fund by such commissioners with power to use the same with the consent of a majority in the purchase of tires from any or all of the licensees, and to sell the same to the trade at such prices as they should deem for the best interest of all; it being within the right of the owner of the patent, either itself or through its licensees, to push the sale of its tires, and, in doing so, to undersell the makers of other tires or infringers.

INDIANA MFG. CO. v. J. I. CASE THRESHING MACH. CO.

(Circuit Court of Appeals, Seventh Circuit. April 16, 1907. 154 F. R. p. 365.)

1. PATENTS-INFRINGEMENT-SUIT BY OWNER AGAINST LICENSEE.

A suit by the owner of pateuts to enjoin a licensee from usiug any of the patented devices except on the terms imposed by the license contract is not onc for the specific performauce of the contract, but is one to enjoin infringement of the patents by excluding defendant from that part of the patent domain not granted by the contract, and is maintainable in a federal court of equity irrespective of the validity of the contract.

2. SAME—VALIDITY AND SCOPE-PNEUMATIC STRAW STACKERS.

The Buchanan patent No. 467,476, for a pneumatic straw stacker, covers the uniting of old elements to perform a novel and useful combination of a generic character, and its claims are not limited iu scope by anything in the prior art. Such patent is dominant in the art, and the patents to Nethery, Nos. 49,374 aud 517,475, and to Landis, Nos. 512,553 and 514,266, are for improvements only and subordinate thereto, and the uniting of all in a siugle ownership is not therefore in restraint of competition.

3. MONOPOLIES — RESTRAINT OF TTADE—CONTRACTS RELATING TO PATENTED ARTICLES.

Complainant, which was the owner of a number of patents relating to pneumatic straw stackers, granted licenses to manufacturers of threshing machines by which they were given the right to use any or all inventions covered by such patents and required to sell stackers made thereunder at a stated price, and to pay complainant a royalty on each stacker so made and sold. They were also given the right to use the inventions covered by any other patents relating to the art which should thereafter be acquired by complainant, and it did afterward acquire the ownership of practically all patents relating to such stackers. Held, that such contracts were not in restraint of competition and in violation of the Sherman anti-trust act of July 2, 1890, (26 Stat. 209, c. 647, [U. S. Comp. St. 1901, p. 3200]), but were within complainant's right under the patent laws, although all of the manufacturers of threshing machines in the United States became licensees, there being no right in the public to free competition in articles covered by patents.

LAMBERT HOISTING ENGINE CO. v. LIDGERWOOD MFG. CO.

(Circuit Court of Appeals, Third Circuit. May 7, 1907. 154 F. R. p. 372.)

1. PATENTS — INFRINGEMENT—EQUIVALENT PARTS.

Where three separate elements in a patented device, each performing an individual function, are supplanted in another device by a single element which itself performs the functions of all three, the threefold capacity of the single element is not the equivalent of the three separate elements.

2. SAME—CONVEYING APPARATUS.

The North patent, No. 480,029, for a conveying apparatus, relating to fall rope carriers for cable conveyors, is not infringed by the device of the Delaney & Lambert pateut, No. 829,911. Held infringed, however, by another device manufactured by defendant.

3. SAME—INVENTION—CABLE HOIST.

The Dusedau patent, No. 550,973, for a cable hoist, is void for lack of invention.

FIELDING et al. v. CROUSE-HINDS ELECTRIC CO.

(Circuit Court of Appeals, Second Circuit. April 30, 1907. 154 F. R. p. 377.)

PATENTS — INVENTION — ELECTRICAL RECEPTACLE.

The Fielding patent, No. 714,290, for an electrical receptacle which covers an improvement on the device of the patentee's earlier patent No. 660,154, is void for lack of invention.

STREAT v. FINCH, YOUNG & McCONVILLE.

(Circuit Court, D. Minnesota, Third Division November 7, 1904. 154 F. R. p. 378.)

1. PATENTS—ACTION FOR INFRINGEMENT—PLEADING.

The complaint in an action for infringement of a patent must allege that the article as made thereunder was marked with uotice of the patent, or that notice of the infringement was given to the defendant.

2. SAME—INVENTION-WATERPROOF FABRIC.

The Streat patent, No. 260,063, for a waterproof fabric made by uniting two fabrics with rubber cemeut, held void on its face for lack of invention.

MATHEWS GRAVITY CARRIER CO. v. LISTER et al.

(Circuit Court, D. Miunesota, Fourth Division Nov. 16, 1906. 154 F. R. p. 490.)

1. PATENTS—SUIT FOR INFRINGEMENT—ESTOPPEL OF ASSIGNOR TO DENY VALIDITY.

One of the patentees of a device who joined in an assignment of the patent is estopped to deny the validity of any of its claims when sued by the assignee for its iufringement, and the estoppel extends to a corporation which he was iustrumental in forming and iu which he is a stockholder.

2. SAME —PRELIMINARY INJUNCTION.

The showing made as to infringement of a patent on a motion for a preliminary iujunction held insufficient to warraut the granting of such injunction.

LAMBERT SNYDER CO. v. AMERICAN VIBRATOR CO. et al.

(Circuit Court, D. Maryland. August 8, 1906. 154 F. R. p. 492.)

PATENTS— SUIT FOR INFRINGEMENT — PRELIMINARY INJUNCTION.

Evidence considered on a motiou for a preliminary injunction to restrain infringement of a patent, and held not to sustain the claim of the defendaut that the infringing articles sold by him were the same that had been seized and sold under an attachment against a licensee of complainant, and an injuuction against their sale grauted, their infringing character being clear.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Simon C. Johnson and George H. Miller, De Kalb, Ill. Car Replacer.—An object of this invention is to provide a car replacer, capable of a variety of adjustments to suit the position of derailed wheels, and equipped with inner and outer wheel replacers. adapted to be arranged at either side of the track, and provided with means for engaging the rails and the spikes thereof to prevent them from slipping sideways or tipping over.

Ira J. Neff, St. Joseph, Michigan, inventor; Elie H. Lee and Elmer L. Lloyd, asssignees, Elkhart, Indiana. Burglar Alarm.—An object of the present invention is to provide a burglar alarm adapted to be readily applied to a window, and capable of exploding a cartridge should the sash be surreptitiously raised. It is also an object of the invention to enable the device to be arranged so that the sash may be freely opened and closed without operating the alarm.

George H. Ruhlman and George C. Miller, Cardington, Ohio. Washing Machine.—An object of this invention is to provide a washing machine, adapted to rapidly and thoroughly wash clothes and other fabrics without injuring them, and equipped with rotary rubbing devices arranged so as to prevent the clothes from collecting in a wad at the center, and capable of constantly changing the position of the clothes so as to bring all portions of the same in contact with the rotary rubbers.

James R. Wilson, Lawson, Mo. Lace Cabinet.—An object of the present invention is to provide a cabinet designed particularly for displaying laces, ribbons, and the like, and adapted to expose the ends of the lace for exhibiting the various patterns, and capable of enabling the desired quantity of material to be readily obtained by simply pulling the lace outward. Another object of the invention is to render the cabinet dust proof, and to provide doors or closures, adapted in addition to excluding dust, to serve as means for holding the free ends of the lace without liability of fraying the material when the same is drawn from the cabinet.

John C. Carr, Burlington, Indiana. Folding Flue Stop.—This invention has for its object to provide a flue stop designed for closing stove pipe openings in chimneys and flues, and adapted to be compactly folded when not in use, and capable when applied to an opening of remaining in proper position tight against the wall. Another object of the invention is to enable the flue stop, when introduced into a stove pipe opening, to push the soot back into the flue hole and thereby prevent the soot from falling upon a floor or carpet, and also from soiling or igniting the wall paper.

Posey P. Brooks, Hattiesburg, Miss. Automatic Cylinder Drain Valve.—The object of this invention is to provide an automatic valve, designed for use on the cylinders of locomotives, pumps, and the like, and adapted to enable the water resulting from the condensation of the steam to be readily ejected when desired. Another object of the invention is to enable the automatic drain valve to be maintained in a closed position by fluid pressure under the control of the engineer, and to cause the valve to open automatically to permit the escape of steam and water when the pressure is reduced by the engineer.

Louis J. Allard, Fall River, Mass. Sleigh Runner Attachment.—The invention comprehends runners that can be applied to wagon wheels so as to convert the vehicle into a sleigh without the necessity of removing the wheels from the wagon. The runnner body has a seat in which the wheel is engaged, and novel clamping devices secure the runner directly to the wheel. The construction is such that the runner will accommodate itself to the inequalities of the ground.

Eugene S. Henry and David B. Camp, Boise, Ida. Elevating Means.—The mechanism covered by this patent is particularly intended for raising grain, water and the like, and is so constructed that the weight of the material being raised is counterbalanced, thereby requiring less power to elevate the same. An ordinary elevator is employed, to which is attached a motor wheel into which the material elevated is deposited, the operating means for the elevator being connected to the wheel.

Jean Orteig, Phoenix, Arizona. Horse Detacher.—It is the aim of the present invention to provide a horse detacher, adapted to be readily operated by the occupant in a vehicle in the event of a run-away, and capable of positively freeing the traces and thereby releasing the animal. Another object of the invention is to provide a horse detacher, adapted to facilitate hitching and unhitching and having means for holding the trace-engaging devices either open or closed, so that after a horse has been unhitched, the said devices will remain open until the horse is again hitched to the vehicle.

George F. Wentz, St. Louis, Mo. Distilling Apparatus. Two patents.—This inventor has secured very broad protection on a novel form of distilling apparatus that is adapted for household purposes or more general use, and in which the distilled water is thoroughly aerated, thus eliminating the flat taste so objectionable in this beverage. The apparatus comprises a steam generator with a condenser, the latter being preferably connected to an ordinary kitchen boiler. A steam pipe connects the generator and condenser, and includes an air injector. A reservoir is provided for the water of distillation, and a combined water and air discharge pipe extends from the condenser to the lower portion of the reservoir so that its discharge end will be submerged in the water of distillation. As a result, the air carried into the steam by the injector is forced downwardly through the discharge end of the pipe and bubbles up through the distilled water.

The second patent covers a number of improvements over the apparatus disclosed in the earlier patent, among the most important features of which is a generator comprising an inner reservoir and an outer casing with a gas burner located between the two. Automatic means is employed for supplying water to the reservoir from an ordinary kitchen boiler, and this supplying means is so arranged that it will produce a gyratory movement of the water in the reservoir and cause the sediment to collect at a central trap from which it may be readily removed.

William L. Carter, inventor; Waterloo Register Co., assignee, Waterloo, Iowa. Register.—The patent covers an improvement in hot air registers, and one of the important features is the provision of a foot rest that constitutes means for opening and closing the register, the rest extending across the grating when the register is opened so that if a person's feet are placed thereon, they will lie directly in the current of warm air from the register. There is also provided a novel water pan that is detachably located in the upper portion of the register and constitutes means for deflecting hot air outwardly through the same.

Jasper F. Kobler, Niagara Falls, N. Y. Capsule Filling Machine.—As the title indicates, the invention covered by the patent is a machine for filling capsules with medicinal materials. It consists of a chamber having side walls and a bottom, with tubes extending through the side walls and across the bottom, these tubes having open sides within the chamber and having projecting ends on which capsules can be placed. A pressing plunger operates in the chamber to force the material into the open sides of the tubes, and a plunger is movable longitudinally through the tubes for expelling the material into the capsules. By this arrangement, each capsule has a predetermined amount only of material and all receive an equal amount.

Percy Sternau, inventor; George H. Brooks, assignee of one-half interest, Louisville, Ky. Stamp Holding Box.—Mr. Sternau has produced a box for holding ordinary rubber stamps so that they are in inked condition when removed. The structure of the box is very simple, and comprises a body having a bottom and a top hinged to the rear side wall. On the bottom of the box is located a pad, and a tray detachably fitted in the box is divided into compartments, and has a bottom of material that will permit the passage of ink. The stamps are placed in the compartments with their faces resting on the bottom, so that they are properly inked and are ready for use whenever they are removed.

Mathew Rapp, of Morton, Illinois. Boiler.—This boiler is particularly intended for heating purposes. The object has been to provide a simple structure made up of sections which can be readily taken apart so that the interior of the boiler is entirely accessible, and is furthermore constructed so that it is not liable to be burned out, The structure maintains the water and products of combustion in intimate relation during the passage of the latter through the boiler, thereby effectively utilizing the heat from said products of combustion.

Wm. I. Finkenbinder, Coraopolis, Pa. Rolling Mill.—The invention relates to means for retaining the stretches in place between the coupling boxes of a mill. To this end a band is employed composed of hingedly connected sections, the free ends of the sections being provided with outturned lips. A novel yielding connection is made between these lips. Each section has secured to it stretcher blocks that are seated in the ordinary grooves or recesses of the spindles.

William James, Greenville, Miss. Ruffler Attachment for Sewing Machines.—The object of the invention is to enable a ruffle to be applied to a garment by a single operation of the machine, without the material of the garment coming in contact with the arm of the machine or adjacent portions of the same, thereby saving both time and labor, and at the same time, preventing the fabric from being soiled by the flow of oil from the machine. A further object is to so arrange the parts that the skirt or other garment, to which a ruffle is to be applied, will lie to the left of the needle bar in position to be supported by the leaf of the machine, while the material to be ruffled is introduced into the ruffler at the right hand side and guided by the right hand. By the use of the invention, lace or braid may be applied to the garment simultaneously with the ruffling operation.

Hallock R. McDonald, Lisbon, Ohio. Hold-Back for Harness.—The object of this invention is to provide a simple and inexpensive hold-back which will enable a horse to be hitched and unhitched more rapidly than heretofore, and at the same time afford an animal a better hold on a buggy or other vehicle. A further object is to construct a hold-back extending from the breeching to the point or outer end of the shaft. and detachably engaging the latter, whereby, after the hold-back has been placed on the outer end of the shaft, it is only necessary to fasten the traces and belly band to complete the hitching operation.

Michael Andes, Wilkesbarre, Pa. Composite Fuel.—The object of this invention is to construct a briquet which will possess the requisite stability or cohesive power, and which is so organized that while substantially bituminous in character, it will burn without excessive caking, which characterizes the burning of bituminous coal. The invention comprises a body or briquet formed of a predominating quantity of bituminous coal slack, a comparatively small quantity of anthracite slack, and a binder of cement, the quantity of bituminous slack being more than twice the quantity of anthracite slack.

William E. Louden, Lisbon, Ohio. Nut Lock.—The aim of this inventor has been to provide a simple structure for securely holding the nuts of a rail joint against turning, and yet will permit the same to be removed and replaced by workmen. Instead of the ordinary devices, nuts are employed having angular necks, and a locking bar that fits behind the nuts is provided with key-hole slots in which the necks are seecured. This locking bar is held in place by the ordinary spikes.

Horace G. Alexander, Londonderry, Vt. Cooling Attachment for Explosive Engines.—A hood is employed that is placed over the head of the engine, and is provided with a plurality of pipes extending alongside the same and having perforations in their inner sides. The hood is connected to an air pump so that jets of air are directed against the cylinder to maintain the same in cooled condition.

Harry B. Drew, Kittery Depot, Maine. Folding Box.—This inventor has provided a lunch box constructed of leatheroid or similar material that can be conveniently set up and can be compactly folded into small compass. It is composed of hingedly connected sections, and has an internal tray beneath which a bottle of coffee or other liquid refreshment can be placed.

Hans. L. Rued, Butterfield, Minn. Safety Attachment for Whiffletrees.—The object of this invention is to provide a simple device adapted to be readily applied to the tongue or pole of a vehicle, and capable of equalizing the draft so as to obviate the pulling of the tongue or pole either backwardly or downwardly. In this way, a direct pull is afforded, and there is less danger of the necks of the horses becoming sore. A further object of the invention is to provide a device of this character adapted to prevent the singletrees from dropping to the ground should their pivot bolts become broken. The device is constructed of a single piece of metal and may be readily applied to the ordinary construction of vehicle.

Ira I. Sides, Greeley, Colo. Combined Ruler and Blotter.—This is an article of manufacture consisting of sheet metal having one end pointed and the other end curved. Scales are located along the various margins, and tongues cut from the body of the ruler thus produced, engage blotters that are held against the under side of the same.

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FOR SALE—Patent on the latest improved tag writing machine. Address, C. F. Shepherd, 723 North Jefferson St., Springfield, Mo. nov

FOR SALE—Patent No. 888,898. Attachment for wagons. Made of spring wire to hold seat in place on farm wagons. Simple, inexpensive, durable and easily attached. Address, Lucius S. Hyde, Spanish, Mont. nov

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FOR SALE—Patent No. 878,968, dated Feb. 11, 1908. Pipe and Bolt Wrench. Will sell outright reasonably. Address, Frank Lindsay, Etna, Pa. oct

FOR SALE—Patent No. 885,963, dated April 28, 1908. Potato Planter. Cuts, plants and covers seven acres per day. Knife and planter driven by pitman. Depth adjusted by tilting levers of ordinary mower. One man does the work of twenty. Address, John Sieffert, Winnepegosis P. O., Manitoha, Canada. oct

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WANTED.

WANTED—An individual or corporation to undertake the manufacture of Automobile Sled Attachments, Patent No. 888,932. Investigate if interested. Address, H. H. Rohlf, New London, Wisc. oct

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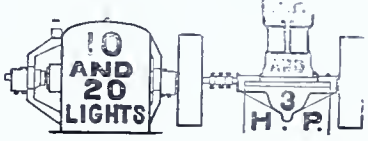
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WASHINGTON, D. C., OCTOBER 1, 1908.

New British Patent Law.

American manufacturers and patentees will await with interest the result of the action of a congress held in Stockholm in the last week in August. This congress was that of the International Association for the Protection of Industrial Property, and the new British patent law was the subject that attracted the most attention. The provisions of this new law, which was passed by the British Parliament in 1906 and which took effect in August, have already been discussed in these columns. The change which most directly affects our manufacturers is the requirement that all articles patented and sold in Great Britain should be manufactured in that country within a certain time after the grant of the patent. The United States law differs from that of all other industrial countries, in not demanding this "working" of the patent. In our country, after a patent is granted, it is within the right of the owner to manufacture or not, according to his convenience. Patents in enormous numbers are placed on the market, as witness the unexampled development of the country in the mechanical line; but a still greater number remains buried in the archives of the Patent Office and the memories of the inventors, and so far from being an aid to industrial progress, they are a drawback, as they prevent other people from patenting and perhaps manufacturing similar devices. As we have already noted, we are in this respect unique among nations. The patent laws of all other countries of importance insist that if a patentee is accorded protection for his invention, he must manufacture it and put it on the market, so that the public may benefit by it. Great Britain has fallen into line by adopting the same provision, and German and American manufacturers (the ones most directly concerned) are now taking steps to have their articles produced across the water. There has been a widespread protest against the enforcement of the British law. It was discussed fully at the congress at Stockholm, and measures were taken to endeavor to secure modifications. Representatives of the United States argued that the new law is a menace to our manufacturing industries, and that its passage modified the treaty of Paris in 1883, which provided for the mutual grant of patents on equal terms. Twenty-four nations, including England and the United States, subscribed to this treaty, and it was held that the country which prides itself upon free trade should not be the first of these two to pass a law so restrictive in character as that outlined. It is, in fact, conceivable that the strict and broad application of this provision would shut out from the United Kingdom every foreign manufactured product which could be made, and which the British preferred should be made, in that country.

Another section, which will likewise affect American manufacturers, makes unlawful any contract prohibiting or restricting the purchaser, lessee or licensee of a patented article or process from using any article or process supplied or owned by any person other than the seller, lessor or licensor; or requiring the purchaser to acquire from the seller any article not protected by the patent One of our consuls in England points out that some kinds of machinery imported from the United States have been used under a lease and could not be bought. Complaint has been made that the lessee is tied to the machine for a period of years, paying heavy royalties, which at the end of the period sometimes amount to the price of the machine: and that under the contract he cannot use the machine unless all other machines used by him in doing other parts of the work are also held from the same lessor. The section above quoted is obviously intended to abolish the leasing system by illegalizing its monopoly feature. It is claimed, on the other hand, that the leasing system has been of great advantage in many ways, especially to men beginning business or with limited capital: and however burdensome the royalty may be, British manufacturers would not have used the system unless it had paid them.

How far the law will affect our products generally, and whether the action of the Stockholm congress will have any effect, is as yet a matter of conjecture. Much depends upon the disposition of the British people. The consul thinks that in the case of shoe machinery, to take one instance, the law will not prevent American patentees from making the various parts of their machines in the United States, and putting them together across the water. Four years are permitted in which to work the patent, and we may add that unless the law is enforced with extreme strictness, means may usually be found of complying with its technical requirements without subjecting patentees to serious inconvenience.

Power from Mud.

The action taken by congress at its last session, in appropriating a large sum of money for the drainage of swamps throughout the country, has attracted general attention to the possibilities of these tracts of waste land. The overflowed area in the United States amounts to upwards of 80,000,000 acres, and it is estimated that if less than one-third were reclaimed, the wealth of the country in agricultural lands would be increased by at least two and a half billion dollars, and the crop values by three-fourths of a million dollars. Those who find in figures the most adequate expression of the idea, have calculated that if this great area were subdivided into farms of 40 acres each, it would provide homes for a million and a quarter families, and place about six million people upon farm land now practically valueless. The irrigation works undertaken by the government in the West have been carried out with vigor and success; and if the drainage of swamps be entered upon with the same energy, it is believed that even greater results can be accomplished. Not only will these unsightly and unhealthy stretches of marsh and bog be transformed into productive farms, but they will provide homes for our swelling population and convenient sources of agricultural products to the ever-growing home market. The plan would add to the very heart of the national domain lands that, measured in productive capacity, equal the combined arable areas of the fertile States of Ohio, Indiana, and Illinois.

An incidental source of revenue in this reclamation work, but the importance of which is becoming daily more apparant, is the utilization for fuel of the layers of peat. The possibilities of the peat industry in America have been from time to time commented upon in these columns, and the latest development is the formation of a society devoted to the utilization of our peat resources.

For many generations peat has been used for domestic fuel in Northern Europe, and the widespread use of this product has resulted in the evolution of elaborate machinery for digging peat, for grinding it to make it more compact, and for molding it into blocks of regular size. In Germany especially, where nothing valuable is ever permitted to go to waste, this industry has been developed, and it is surprising for how many purposes, besides fuel, peat has been utilized. The peasant of the Fatherland builds his cottage, makes bedding for his family and for his cow, feeds the latter, fertilizes his land, and warms himself, from this product of the earth. Peat straw is an excellent litter for stables, and mattresses made of it are considered so superior from a sanitary standpoint that they are extensively employed in hospitals. The fiber is compressed by a special process into tiles and blocks for building purposes, these constituting one of the cheapest of all architectural materials. The moss, when combined with the waste molasses of beet sugar manufacture, produces a compound that serves acceptably as food for domestic animals. But however interesting these products may be from the standpoint of novelty, it is as fuel that peat will find its chief adaptation in the United States. It is predicted that at the present rate of consumption, the next generation will see the exhaustion of our deposits of coal, and we will be forced to find another source of heat and power. There are large tracts of peat in Iowa, Wisconsin, North Dakota, California, and at intervals along the eastern seaboard from Massachusetts to Florida. The most valuable, however, exist in Minnesota, where hundreds of acres of peat several feet in depth have been found. In the treatment of these deposits we can profit by the experience of Europe, and if the Germans and Swedes have found it remunerative to use mud for heat and power purposes, it cannot be questioned that we can do the same. Briquettes of peat have been proved to be advantageous for steam production; and there are still greater possibilities in connection with the gas engine. The U. S. Geological Survey has been making experiments with gas engines, and has found that the poorest grade of coal—slack or waste—can be utilized with success. The value of these materials for producing gas is, in fact, exactly inverse to their value in the direct production of steam. In other words, the poorer the coal for direct steam production (by which power coal has been valued in the past) the more valuable it is for yielding gas for use in the gas engine. But, as is well known, the gas engine is relatively a new comer in the field of mechanics. It is passing through a period of various transitions, the vertical engines being replaced by the horizontal, the single by the double acting. Other changes are being made which tend to do for the gas engine what compounding and tripling the expansions have already done for the steam engine. When this has been accomplished, no one can predict what further revolution may take place in our ideas as to the relative value of fuels. It has already been declared that Florida peat, dried and compressed into blocks, produces gas which yields results fully as good as Texas and North Dakota lignites; and where power is the object sought, the best method of utilizing the peat is to convert it into fuel gas. Central power plants might be established at the bogs, and the peat converted into electricity, which can be transmitted to any required point. This would mean a source of power at half the present cost. Our neighbor on the north is about to spend $50,000 in the establishment of a peat experiment station, the deposits in Canada being extensive and the fuel problem an urgent one. A bill has been introduced before Congress to appropriate $25,000 for a similar station in this country, and the matter is of sufficient importance to warrant the hope that legislative action will be taken next winter.

Wireless Power.

An important invention is announced from France, consisting of the transmission of electrical power without the use of wires. The system is said to be an extension of the wireless use of electricity, and while details have not yet been given to the public, experiments have been made in Lyons, in which a miniature street car was moved over a flat space by electricity communicated from a distance of several yards. The invention is about to be applied to a street car line, and also to different kinds of machinery.

Cure for Pneumonia.

One of the most remarkable characteristics of modern medicine is the increasing use of serum of animals immunized by bacteria. Pneumonia is the latest disease to which this treatment has been applied, and the results obtained with serum, though not as striking as those obtained with diphtheria antitoxin, have been encouraging. The new cure is said to be bactericidal, not antitoxic, in character. It is to be hoped that the future will confirm the present outlook for this remedy.

Tallow from Trees.

Among the curiosities of the vegetable kingdom is a tree which produces tallow. It is a native of China, and has heart shaped leaves, which turn red in the autumn. The seed pods contain seeds of a grayish white color, of about the size of a coffee bean. When the pods dry, the seeds are picked and steamed, and the white exterior is removed and melted, the resulting substance being a kind of tallow which is useful in the manufacture of candles. The interior of the seed is ground, boiled and pressed, and an oil extracted, which serves for illuminating purposes. The tallow is also found serviceable in the manufacture of soap.

Typesetting by Wireless.

Wireless power is being used experimentally in various lines, and the latest is in setting type. The statement is supported by no less an authority than Han Knudsen, the Dane, who has already made a record from his inventions in long distance photography and in liquid air. He says that he can set type in an ordinary linotype machine in Paris by wireless waves thrown from London. He declares that the machine used in the trial set 3,000 words an hour at a distance, just as if the operator were working the machine; and the prediction is made that in time the Paris correspondents of London papers will send their news straight to press through the Marconi operator.

New Marine Engine.

A rival of the turbine has developed in an engine recently exhibited in Liverpool, and described by our consul at that point. It is said to be a radial engine, and has the advantage of reversing by almost instantaneous action—a characteristic which is especially useful for steamships. The engine, which is very simple in construction, consists of a cylinder securely bolted to a bed plate with a cylinder cover at each end, and a shaft passing through the covers and supported on either side by a bearing. On the top of the cylinder is a small chest with a control valve. The important principle is that the steam pressure is direct on the piston from the boiler. The leverage is direct and unvariable, the part of the mechanism affected by the steam being always at the greatest distance from the shaft centre. It is claimed that in economy in space and fuel it is superior to the turbine, and that it can develop one-third more power than any other existing engine of the same piston area.

Glass by Machinery.

There are now in successful operation a number of machines for making glass of various kinds, but window glass has been a stumbling block for inventors. Glass for windows has been made, it is true, but the work has failed to be satisfactory in certain details. It is now reported that a device has been put on the market which makes a perfect product. A continuous sheet 42 inches wide is turned out at the rate of 56 inches a minute, and all without the aid of blowers, gatherers or snappers. It is necessary to employ cutters and a superintendent, but it is predicted that automatic attachments will ultimately enable the machine to dispense with the aid of these as well. The plant in which the machine operates requires the services of but three men and six boys to a machine, and yet turns out more and better glass than thirty-nine men could produce with the old cylinder process.

Safety Cage for Mines.

Among the recent inventions to lessen the dangers for those who earn their daily bread in the depths of the earth, is a cage adapted to enable the escape of miners from the pit, in case of necessity. The invention, which can be applied to any kind of mine elevator, has the advantage of being adaptable equally well to steel, wood, rope, or any form of guides that may be in use. The cage is fitted with sliding bars, each having a gripping screw with a weight or spring attached, by which the bars are coupled to the guides should the hauling or winding rope break, and without in any way damaging the guides. A particular feature is the automatic gripping action exercised on the guide ropes by the weight of the cage itself, and its immediate but gentle arrest in the event in the breaking of the winding rope. Thus, it is asserted, there can be no severe jerk or sudden stoppage, and no danger of the occupants of the cage being thrown against the roof should an accident occur. With this system the risk of breakage of the winding ropes is minimized.

An Improved Winch.

There is probably no other part of the equipment of steamships that has given rise to more trouble and annoyance than that of the steam winch. Especially does this apply to passenger vessels, where the present form of winch often intrudes its disagreeable noise upon the travelers. Numerous patents have been taken out for the elimination of this disadvantage, but so far with only qualified success. Anything that can be put on the market which will do away with the intolerable rattle of the steam winch as it now exists will be welcomed by the traveling public, as well as by shipowners, and there is therefore considerable interest in a recent British invention, which substitutes the sprocket and chain system for the cog. It is claimed that a winch driven by this method is almost silent in its working. A Liverpool shipping paper declares that the nearest approach to noise which attended the lifting of weights was only similar to the burr common to a motor car, instead of the usual rattle and crash of the steam winch. It is expected that this new type will be largely adopted by shipping interests.

Speed Indicator for Automobiles.

There has arisen of late a demand for a reliable and accurate speed register for motor cars. When chauffeurs are arrested on the charge of exceeding the speed limit, it is often difficult to establish with certainty the precise rate of speed at which the vehicle was traveling, and for purposes of investigation in accidents, it is often of importance to have more accurate records than can be obtained from the testimony of eye witnesses. A device which is now being tried in Europe promises to meet this demand. It consists of a box placed directly in front of the chauffeur, and contains certain machinery which is connected to the axle by a flexible rod that transmits each revolution of the wheel to the registering apparatus. The mechanism is arranged to mark three different rates of speed: 10, 20, and 40 miles an hour, indicated respectively by a white, red and blue disk. Thus when the car is running in a town where the speed limit does not exceed ten miles an hour, the white disk should be visible; if in the country, the red or blue disk should be seen. In this manner the moment a car is near enough to permit of the disk being seen, the rate of speed is known. The register is also arranged to indicate the rate by means of an endless revolving ribbon connected with the mechanism. The box containing the registering mechanism is sealed so that the chauffeur cannot open it or remove registering ribbon or band without the intervention of the authorities. The perforated band may be demanded by the authorities as often as deemed advisable, say once every month, and all indications of having exceeded the speed limit, which the band would have registered, could be noted.

Fireless Engines.

A steam engine that runs without fire is a novelty in this country, but it is being used with success in Germany, where the superheating of steam was first tried. The fireless engine cannot be run in uninterrupted railway service, but is confined to switch-yards, where the tank can be filled with steam at a power station. On this supply the locomotive runs for about five hours in regular switch-work. The steam is not taken on at high pressure. The pressure is about 170 pounds a square inch, which means that it is about the same as that in the boiler of the power station. In order to effect this result the locomotive boiler is filled with water to about three-fourths its capacity. This water is superheated. Steam is admitted by means of coupling from the power plant at the forward end of the boiler, where it passes through a steam admission valve. The junction between the locomotive boiler and the boiler of the plant is effected either by a revolving pipe connection or by means of a swaying arm, or it may be effected by a collecting pipe such as is used in a hydrant. The steam is blown into the cooler water of the engine boiler from the stationary boiler and gives up its heat until the temperature in the two boilers is about the same.

The advantage of a fireless engine is the lack of sparks and smoke, which allows the machine to be used in sheds and other enclosures. It is also economical, as the cost of producing steam in stationary boiler plants is less than when produced by ordinary locomotives. It is especially adapted for use in the neighborhood of power plants, cotton mills, and similar inflammable installations.

Marble Made from Waste.

The idea of producing marble and other stone artificially has long been the aim of inventors, and the problem seems to be in a fair way to be solved. Under processes recently patented, a long step in advance in the manufacture of stone-like substances has been achieved. Ordinary blast furnace slag—a waste material—is taken as the foundation. This is crushed in a stone breaker, and ground to powder in a disintegrator. The powdered slag is then mixed with quicklime, in the proportion of seven parts of slag to one of lime, and the substances are thoroughly amalgamated, mixed with water to form a paste-like mass, and pressed in metal molds. The resultant blocks, which have the consistency of chalk, are dried and placed in stout iron cylinders from which the air is exhausted. Carbonic acid gas is then introduced and allowed to permeate the stone for several days, which has the effect of recarbonating the hydrate of lime, and causing it to bind the mass into a substance as hard as rock.

If it is desired to give this artificial stone the appearance of marble, a certain amount of coloring matter is added to the paste. It has even been found possible to make lithographic stone, which is pronounced by experts to equal some of the best samples of the natural material. The finished stone or marble is capable of a high polish, and is said to possess all the weather-resisting properties of the natural rock.

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Spraying apparatus....F. and F. Koenigkramer
Spraying apparatus....E. F. Sampson
Spring....P. J. Neate
Square, gage, and bevel, Combined....J. Kampe
Stamp, Time-....G. E. Perry. (Reissue.)
Stays, Making....J. Janowitz
Steam-generating apparatus....J. Atwood et al
Steam-generator....F. N. Tilton
Steam-trap....R. L. Wales
Steam-trap, 2 pats....R. Eisentraut et al
Stirrup, Safety-....F. B. Curns
Storage battery....G. A. Ford
Stove-top....C. M. Genthner
Strainer....H. W. Forssman
Strainer, Milk-....E. C. Wagner et al
Strata, Apparatus for extracting the volatilizable contents of sedimentary....D. R. Baker
Stretching-machine bar....C. H. Knapp
Supporting-pin....M. A. Cochran
Swinging gate....G. Hoskins
Swingletree....A. E. Levins
Tabulator, Adding-....C. P. Wetmore
Talking-machine record....E. R. Johnson
Talking-machine sound-box, 2 pats....E. D. Gleason
Tank indicator, Liquid-....H. W. Eden
Telephone coin-box....C. S. Ellis
Telephone coin-operated attachment, Pay-....E. J. Lonergan
Telephone-receiver support....F. Simons
Telephone-support....W. S. Aungst
Telephone supporting deviee, Portable-....W. S. Aungst
Theater-chair....R. H. Gehrke
Ticket dating and delivering apparatus, Automatic....E. W. and H. Bell
Tile....K. McLeod
Tile-mold....H. A. Smyth et al
Tire....E. T. Greenfield
Tire-armor....G. Wilmot, Jr.
Tire-protector....L. Crise
Tire-pump, Automatic....J. C. Booth
Tobacco-pipe....F. Geltz
Toe-plate....F. Brittan
Tool....H. E. Pastorius
Tool-handle....R. H. Smith
Tool, Spring-....W. Avery
Tools, Mechanism for controlling the actions of....W. G. Bungeroth
Torpedo, Propelled....H. Lacy
Tower....L. W. Noyes. (Reissue.)
Trace-carrier....H. Hill
Trammel....C. H. Schade
Transformer, Variable-voltage....M. O. Troy
Transom-lifters, &c., Swivel or attachment for....W. F. O'Rourke
Trolley....F. L. Sessions
Trolley....A. S. Janin
Trolley-support....H. G. Farr
Truck column-guide and bolster construction, Car-....G. G. Floyd et al
Truck, Freight-car and locomotive-tender....R. C. Wright et al
Truck, Railway car-....H. S. Hart
Truck, Swing-motion car-....C. F. Murray
Trunk, harness and clutch....H. M. Sprague
Turbine....A. Jude
Turning device....C. M. Andersen
Turret cross-slides, Means for operating....J. C. Potter
Type-writer-carriage scale or indicator strip....R. Gradwell
Type-writer changeable type....G. Macis
Type-writers, Printing-point indicator for....G. Persson
Type-writing machine....H. A. Briggs
Type-writing machine....C. E. Smith
Type-writing machine....C. E. Tomlinson
Type-writing machine....J. Felbel
Type-writing machines, Ribbon-throw mechanism for....T. Oliver
Underfeed furnace....J. E. Jones
Underskirt....E. Colby
Urinary apparatus....D. Girouard
Vacuum-tube apparatus, 2 pats....D. M. Moore
Vacuum-tube lighting....D. M. Moore
Valve for gasolene-motors, Inlet-....A. J. McCollum
Valve for hot-water heating system, Relief-....A. G. Cripps
Valve-gear....L. E. Feightner
Valve, Pressure-reducing....F. T. Cable
Valve, Tank flush-, 2 pats....H. C. Freshour
Valve-timing device, Explosive-engine....L. L. Kell
Valve with overflow attachment, Regulated automatic swinging....O. E. Noble
Vehicle-body-supporting plate....B. W. and F. M. Burdett
Vehicle-cleaning device....E. P. Gaylord
Vehicle collapsible foot-rest....C. J. Harris
Vehicle-speed signal....G. L. Cooper
Vehicle-wheel....A. Graff
Vehicle-wheel....J. B. Hembree
Vehicle-wheel....A. Schultz
Vehicle-wheel....L. H. Barry
Vehicles, Means for supplying and controlling electric current to motor-....A. Palmros
Velocipede....N. H. Peppler
Vending apparatus, Prepayment....F. E. Morgan
Vending-machine, Coin-operated....F. W. Tucker
Vending-machine coin-receiver....W. C. Hanson
Vending-machine, Newspaper-....W. A. Schenek
Violin....F. M. Stone
Voltage-protector....G. T. Hanchett et al
Voting-machines, Independent-vote mechanism for....S. Loe
Wall-bracket, Electrical-conductor....L. Tinsley
Washing-machine gearing....A. F. Victor
Washing-machine gearing....A. Plagman
Water-closet flushing-tank....C. and E. G. Pfau
Water-closet flushing-tanks, Escape-valve for....C. Pfau
Water-cooler, 2 pats....I. Newell
Water-heater....T. W. Pitcher
Water-heater, Auxiliary....J. Houser
Water-heater, Solar....F. M. Huntoon
Watering fountain, Stock-....B. M. Stiles
Weather-strip....W. J. O'Sullivan et al
Weighing-machine, Automatic....T. R. Weyant
Weighing machine, Fluid-....O. Gunderson
Well strainer, Oil and water....H. R. Decker
Wheel automatic brake, Vehicle-....O. L. Herod
Winding machine, Thread-....T. Hansen
Window-guard....H. H. Ashlock
Window-screen bracket....W. S. Hood
Wire into lightning-rods, Machine for twisting....A. J. Dooley
Wire rods, Process of and apparatus for cooling....F. H. Daniels
Wire-stretcher....W. M. Murfin
Wire-working tool....D. Glenn

Wrapping-machine....R. A. Berger
Wrench....C. M. Andersen
Wrench....W. Muller
Wrench....H. C. Saunders
Wrench adjustable support, Ratchet-..J. Lang

DESIGNS.

Game device, Parlor-....S. D. Stone
Globe, Glass....G. F. Wehr
Pan-lifter....B. F. Bain
Spoon, Souvenir-....C. J. Whellams et al

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MECHANICAL PATENTS.

Abdominal supporter....L. Ross
Air regenerating and purifying apparatus....S. S. Hall et al
Amalgamator....E. Stevens
Ammunition-vehicle....W. Mayer
Amusement apparatus....E. Mayette
Amusement apparatus of the gravity-railway type....R. H. Bishop et al
Amusement apparatus, Public....W. Taylor
Anchor, Stockless....W. S. Bickley
Animal-trap....F. Everhart
Antiseptic cone....G. C. McMurtry
Anvils, Forming....W. F. Ring
Arc-light, Pencil and apparatus for producing the....I. Ladoff
Ash-pan....F. Hibner
Automobile-horn....R. Wright
Bag fastener, Hand-....H. Meltzer et al
Bag-handle and bracelet....G. Auslander
Bailer....F. J. Moser
Baling-press....S. G. Gilleland
Barrel....E. E. Bartholomew
Barrel-heads, &c., Removable closure for the openings of....J. Schmid
Barrel-heater....L. Frick
Battery-control system, Storage-....E. Wray
Battery element, Storage-....J. Bimeler
Bearing, Antifrictional....A. B. Chapman
Bearing, Roller-....G. A. McKeel
Bed, Folding....W. B. De Witt
Bed, Invalid-....U. G. Vance et al
Bed, Wall-....E. B. Pierce
Bedstead, stretcher, and the like....F. Wood
Beehive....R. Williamson
Belt clasp or buckle....G. J. Kelley
Belt-fastener....W. S. Langford
Bicycle spring-frame....C. Blankenheim
Binding-machine....A. F. Preston
Blackleading-machine....F. J. Learman
Blotter-holder and ruler, Combined....W. J. Mogridge
Boat, Submarine....J. M. Cage
Boat, Submarine....G. Behrmann
Boiler-furnace....B. S. De Ball
Bolt clip and connection King...F. E. Wilcox
Bottle-cap and ticket-holder, Combination....J. Hetherington
Bottle-cover....A. A. Roberts
Bottles and like containers, Handle for....B. F. Vogt
Bottles, Cutter for metallic capsules on....H. Klepper
Bottles, jars, and similar receptacles, Closure for....J. B. Larkin
Box....A. B. Klein
Box-fastener....C. F. E. Meier
Box or tank....P. Connolly
Braid....R. C. Rahm
Braiding-machine....R. C. Rahm
Brake....W. C. Marsh
Brake-shoe, Railway....J. S. Baker
Branch sleeve, Connecting....A. P. Smith
Brander....H. E. Marsden
Briquet-making machine....F. E. Abbott
Brush-holder....W. N. Lewis
Brush or polisher, Shoe....E. Wilson
Bucket-bracket....C. Plotke
Buckle....J. J. Buchanan
Buckle....A. Künzler
Buckle, Hame-tug and trace-....J. Ziegler
Buggy attachment....G. Rose et al
Building-block....W. P. Meeker
Buildings against rocking of the ground, Yielding support for safing....E. Boermel
Burglar-alarm, Door-knob....W. S. Hurst
Calendar, Perpetual....W. B. Summerall
Came-lead....S. L. Brown
Can-body flanges, Forming....F. P. McColl
Canceling and marking machine, Stamp....S. J. Evans
Canceling machine, Letter-....S. J. Evans
Candy, Making....J. Stuckes
Car brake, Railway-....J. M. Goodknight
Car, Double-deck....P. J. Ross
Car-fender....J. Dornberger
Car loader, Box-....J. M. Christy
Car, Pit-....J. Childs
Car-replacer....F. A. Millis
Car-supporting frame, Freight-....T. F. Burke
Cars, Fireproof support for electrical wires in railway-....E. T. Robinson
Carbureter....K. G. Johnston
Carbureter air-inlet regulator....A. A. Longuemare
Carbureter gasolene-feed chamber..G. J. Mayer
Carbureting and oil-separating apparatus....F. A. Sylva
Cardboard box....J. E. Thornton
Carding-machine....F. P. Woll et al
Cart lock, Dump-....H. L. Dickinson et al
Cash-carrier....M. R. Collins
Caster, Ball-bearing....H. Denton
Cement-block machine....C. S. Wert
Chain, Drive-....E. F. Morse. (Reissue.)
Chuck....F. Rahm
Churn....W. F. Templeton
Cigar-cutter and match-box, Combined....F. J. Aagland
Cigar-forming machine....E. J. Lake
Cigar-lighter....E. Berg
Cigarettes, Machine for making envelop-like cases for....M. D'Alessandri
Circle-comb....A. Long
Circuit-breaker, Magnetic....R. Scott
Clock, Recording-....A. Kopekin
Clothes-hanger....E. Montgomery
Clothes-line reel....G. P. Kinkennon
Clutch, Friction-....K. G. Johnston
Clutch mechanism for dumb-waiters, &c....A. Svenson
Clutch, Spring-....T. D. Carter
Coin-repository....B. vom Eigen
Clutch-winding arrangement, Electromagnetic-....H. Ast
Coin-controlled mechanism....H. W. Nicholes et al
Collar-stay....C. B. Patterson
Collar-supporter....F. E. Farnham
Comb....I. Fréchette
Compensator, Recoil-....F. J. Mellen et al
Composition of matter....F. A. Lobert
Composition of matter and making the same....W. A. Phillips
Concrete beam, Reinforced....H. B. Andrews
Concrete-building-block mold....C. J. Scheelky
Concrete-construction bar....J. H. Schlafly
Concrete-spreader....J. E. Briggs
Condenser superheater, Vacuum-....C. T. and R. R. Rogers
Condenser, Vacuum...C. T. and R. R. Rogers
Conduit-rod....R. H. Villard
Contract member....H. D. James
Conveyer-rolls, Train of....A. Thomas
Coop, Knockdown....E. C. Mudd
Copper, Hardening....H. V. Draper
Corner-socket....S. M. Chase
Corrugating device....W. W. Stout
Couch, Drop-side....H. B. Arnold
Crane, Portable jib-....H. H. Maxfield et al
Crate, Collapsible....I. V. Holloway
Crate-cover fastening device, Shipping-....J. M. Wentz
Crate, Folding....M. Hutchinson
Crucifix-holder....J. L. Paul
Cuff and wristband fastener....R. Onffroy
Cultivator....W. E. Johnson
Culvert....D. C. Boyd
Deck-plate and the like....W. H. Durkee
Desk and seat, Combined....W. Kimmel
Die-block....W. R. Forsyth
Display-card for sample-cases....E. T. Marsh
Display-stand....G. E. Fredericks
Distillation apparatus....H. O. Chute
Distillation process....H. O. Chute
Distilling wood....T. B. Gautier
Dividers, Proportional....G. H. Benedict
Door-check....W. L. Perkinson
Door-check....W. A. Ralston
Door-hanger....A. O. Banks et al
Door-hanger track....S. W. Beeson
Door lock, Sliding-....D. H. Piquotte
Door, Metallic....A. H. Bobb
Door-spring....J. A. Fretz
Doors, Roller-support for edgewise-movable....T. S. Miles et al
Draw-gage and cutter....N. Hughes
Drill....W. R. Down
Drill attachment, Post-....R. Valliant
Dust-remover, Pneumatic....M. E. Freeman
Egg-strainer....H. J. Walz et al
Electric apparatus, Gas or vapor....M. von Recklinghausen
Electric-cable branch connection..J. J. Dossert
Electric-circuit-breaker terminal piece....C. Aalborg
Electric currents, Means for regulating the supply of....C. M. P. Montbarbon
Electric heater....E. M. Hewlett
Electric machine, Dynamo-, 2 pats....H. G. Reist
Electrical testing instrument....C. D. Jarvis
Electrode....H. Pauling
Electrode for electric furnaces...F. M. Becket
Electrolytic cell....G. C. Landis
Elevating and dumping apparatus....I. S. McBride
Elevator safety-brake....A. A. Brown
Elevator-shaft safety-net....J. S. Kerfoot
Engine....S. Lawson
Engine....S. H. Brundige
Engine, Device for simultaneously controlling the spark and throttle of an internal-combustion....H. Lemp
Engine starting device, Hydrocarbon-....R. Huff
Engine-starting safety-clutch, Gas-....W. S. Jones
Engine-stop, Automatic....N. C. Locke
Engines and the like, Cylinder for gas-....C. Houben
Engines in self-propelled vehicles, Starter for explosion-....D. B. Gardner
Engines, Incandescent igniter for gas-....J. S. Lang
Eraser holder, Chalk-....F. C. Woods
Escalator-landing....E. L. Gale, Sr.
Evaporating and concentrating apparatus, Liquid....C. L. Prache et al
Exhaust and signal control....J. D. Maxwell
Explosive....W. Rickmers
Explosives, Shipping and storing....F. L. Chamberlin
Extension-table....J. Haut
Eyeglasses....G. J. Lowres
Fabric-striping apparatus....W. H. Adams
Fan....O. Selg
Fan....H. E. Walker
Fare-recorder....J. J. Joines
Fare-register setting and operating device....J. F. Ohmer
Feed-bag....L. M. Burke
Feed-box....F. M. Bennett
Feeder....F. M. Mott
Fence....A. O. Huffman
Fence-post....W. E. Wolfe et al
Fender....W. J. Birchell
File, Revoluble cabinet-....W. A. Hadden
Filing-cabinet....E. D. Trautman et al
Filler....G. H. Easley et al
Filter....A. A. Bowser
Filter-frame....G. H. Clevenger
Filter, Water-....M. Ray
Filtering apparatus, Vacuum....C. Butters
Fire-escape....M. Pike
Fire-escape....L. Jansoone
Firearm, Automatic....S. Mangle
Firearm, Automatic....W. I. Whiting
Fireproof shutter....H. L. Turner
Flask hinge and pin corner, Foundry-....W. Hales
Floor-jack....H. T. and E. M. Spedden
Flue-cleaner....W. Deuchar
Flue-thimble....J. L. Droesch
Fluid-motor....F. E. Jenkins
Fluids, Apparatus for electrolysis of....E. Weichert
Folding-machine....A. Baruch
Freezing to the sides of a receptacle, Preventing moisture-containing material from....S. G. Stevens
Fume-arrester....H. Howard
Furnace....F. T. Snyder
Fuse, Mechanical time-....J. F. Meigs et al
Game-board....W. J. M. Walker
Garment-clasp....M. W. Schloss
Garment-hanger....E. J. Noble
Gas analysis, Apparatus for automatic and continuous....W. S. Hubbard
Gas and air mixing apparatus..E. Dankelmann
Gas-burner, Incandescent....C. W. Harrison et al
Gas-burner valve, Distance-lighting....R. N. Oakman
Gas-cleaner....A. Ernst
Gas-engine....G. B. Petsche
Gas-forming chemicals, Portable container for....H. J. Mittel
Gas-nozzle dirt-retainer....H. Süssmann
Gases, Apparatus for washing iron-blast-furnace....B. H. Thwaite
Gasket....J. H. Glauber
Gear, Change-speed driving-....A. T. Collier
Gearing, Power-transmission....G. Milner
Glass-cutter....F. W. Roller
Glass-holding receptacle, Molten-....A. J. Bates
Glass, Shaping....H. L. Dixon et al
Glue-testing process and apparatus....C. M. Zimmerman
Governor, Steam-engine....J. W. Gardner
Grate....J. G. Crowdes
Gravity-lock....O. Wiegmann
Green or hot house....P. Minder
Gun-closure locking device....M. Hermsdorf
Gun-pointing attachment....M. H. Gardner
Hair-tonic....S. R. Mackay
Halter....C. W. Schreiter
Hame-hook....A. B. Rosson
Hames, Manufacturing....J. M. Masteller
Hand-operating gate....J. O. Marks
Harness Horse-....J. Caubert
Harvesting machine, Beet-....I. C. and D. W. Lesh
Hat-blocking apparatus....L. Flicker
Hat-pin....H. W. Schloss et al
Hay-cocking machine and hay-loader....G. L. Holliday et al
Heater....A. I. D. Kyle
Heating-pipes, Sanitary dirt-guard for....J. W. Stoker et al
Heels of boots and shoes, Machine for finishing the....W. C. Evans et al
Hoof-trimmer....I. D. De Celle
Horn....L. L. Terhume
Horse-blanket....W. Gordon
Horse-detacher....C. L. Burge
Horseshoe attachment....W. J. Magee
Horseshoe-calks, Die for producing....E. A. Burns
Hydraulic engine and pump....E. C. Roberts
Hydraulic motor and air-compressor, Combined....G. E. Ocain
Hydraulic separator and classifier....C. E. Seymour
Ice-cream freezer....C. F. Barry
Ice-creeper....W. J. Roche
Ice manufacture, Apparatus for...C. M. Smith
Incubator....J. A. Swenson
Incubator heating machanism....J. L. Nix
Indicating stations, advertisements, and other announcements, Apparatus for....A. F. Hayn et al
Insoles, Filling....W. A. Zickerman
Internal-combustion engine....L. S. Watres
Internal-combustion engine....J. Tinlin
Kneading and molding machine attachment, Bread....C. and E. J. Kruse
Labeling-machine....F. C. Williams
Ladder, Fire-....A. L. Haines
Ladder, Folding-....B. B. Neal
Ladder, step-ladder, and scaffold, Combined....C. Fatland
Lamp....S. B. and H. Clarke
Lamp, Arc-....G. N. Chamberlin
Lamp, Arc-....R. Scott
Lamp, Arc-....C. P. Steinmetz et al
Lamp burner, Oil-....J. and M. Lawson
Lamp filament, Incandescent-..W. R. Whitney
Lamp, Gasolene-....J. J. Weyer
Lamp-socket, Plural....E. A. Lefebre, Jr.
Lamps, Elastic suspension for the filaments of electric incandescent....P. Druseidt
Lantern, Signaling-....H. G. Hohnsbeen
Lap-board and book-support, Student's....J. Doeserich
Lathes, Audible signal-device for....H. A. Steinkamp
Leather-blank-cutting die....H. Stockman
Leather-stretcher....W. F. Hysore et al
Lens....W. K. Kight
Letter-opening machine....A. D. Ross
Level attachment, Spirit-....A. Forrer
Lifting-jack....J. Q. Primm
Liquid and cup dispensing apparatus....A. MacLeod
Liquid-separator, Automatic....O. Zerkowitz
Liquids and liquid-containers, Treating....F. B. Camors
Lister-sweep....J. P. Burns
Lock....W. Turner
Lock-tumbler....F. W. Mews
Locomotive cross-head....H. H. Walck
Locomotive, Electric....B. G. Lamme et al
Log-turner....C. L. Burkett
Magnet structure, Field-....H. G. Reist
Mail-bag catcher....S. M. Harden et al
Mail-bag catcher....E. W. Rece
Mail-bag delivering and receiving apparatus...W. A. McLaughlin
Mail-delivering device....W. L. Lightford
Mail-pouch catcher....J. J. Flynn
Mailing device and picture frame, Combination....B. W. Mulkey
Make and-break device....D. Sandretto
Mangle....R. Thoss et al
Manure spreading machine....I. E. Quaintance
Massaging apparatus for the vaginal walls, &c....J. E. Ament
Match-receptacle....M. Joyce
Measuring instrument, Electrical....P. MacGahan
Mechanical manipulator....W. A. Thoms
Mechanical movement....U. S. James
Metal-bending tool....L. P. Hazen
Metal-cutting saw....W. Lewis
Metal-extruding machine....G. H. Benjamin
Metal-sawing machine....W. Lewis
Metals, Extruding....G. H. Benjamin
Metals from ores, Apparatus for extracting....J. H. Reid
Metals from ores, Extracti[illegible]....J. H. [illegible]
Metallic [illegible]ts to [illegible] for attaching....[illegible]
Micrometer-gage....P. [illegible]
Mining apparatus....A. [illegible]
Mirror, Combinati[illegible]....C. D. [illegible]
Moistening machine, Stri[illegible]....J. [illegible]
Mold....H. [illegible]
Mold appli[illegible]....J. M. [illegible]
Mold-forming ma[illegible]....J. B. [illegible]
Molds, Electrical [illegible]....H. [illegible]
Molds, Snap-board [illegible]....W. [illegible]
Molding-machine....H. J. [illegible]
Mop-wringer....Z. L. [illegible]
Mortising-machine....R. S. [illegible]
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Motor....L. H. [illegible]
Motor....O. [illegible]
Motor control, Electric-....G. B. Rossi[illegible]
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Motor frame and gear....F. C[illegible]
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Mud-guard....R. E. Robe[illegible]
Music-leaf turner....D. P. [illegible]
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Music-playing instrument....W. R. Cr[illegible]n
Nail-driving apparatus....[illegible]. A. Fra[illegible]
Nail-machine feeding device....J. S. [illegible]
Napkin ring and hodler, Combined..C. J. [illegible]
Nest, Poultry-....S. W[illegible]
Nut-lock....W. J. Mas[illegible]
Nut-lock....A. L. Hart
Nut-lock....J. W. Harvey
Nut, Lock-....W. E. Rosen
Nut, Locking-....A. V. Bryce
Oil-cup....E. M. Adams et al
Ordnance, Breech-operating mechanism for....C. P. E. Schneider
Organ wind-chest, Pipe-....A. E. Kent
Orthopedic apparatus....F. Jacobson
Oven, Rotary....W. Kosicky
Oyster-opener....A. H. Roters
Package-tie....E. L. Sharpe
Packing-box....J. Wahl
Packing, Rod-....J. Felt
Paper-holder....C. W. Harper
Paper-machines and other purposes, Roll for....W. J. Asher
Paper sheets mutually folded in each other, Receptacle for holding and delivering singly....A. Baruch
Parcel-tying device....L. Litsch
Peat-turf, Apparatus for making half-stuff from....O. P. Beck
Peat-turf, Method and machine for the reduction of....C. E. Dunn
Pen....G. Rentz
Pen, Fountain-....J. G. Coffin
Pen, Reservoir-....H. S. Baker
Permutation-lock....W. H. Jones
Phonograph-disk-record case....I. Herrman
Phonography....I. Kitsee
Pin....E. R. Crecelius
Pin....G. W. Dover
Pipe coupling, Automatic air-....F. Hunter
Pipe-wrench....J. W. Lind
Piping-joint, Flexible....C. Schmidt
Placket-fastener....W. F. Bowen
Plane, Floor-....H. Puder
Planter....H. Rippe
Planter and cultivator....W. L. Paul
Plaster board or plaque....E. C. Roberts
Pliers, Cutting-....H. F. Kellemen
Plow-stalk-cutter attachment....R. B. Human
Plow, Sulky-....O. H. Marx
Plumb....C. F. Thies
Pneumatic apparatus, Variable-tension expression-bellows for....G. P. Brand
Pocket-wrench....M. M. Morgan
Portable bracket....R. J. Birdwell
Post-hole digger and wire-stretcher, Combined....J. J. Armstrong, Sr.
Potash, Production of....S. Sparling
Potato-digger....K. Henke
Powder-packet former....L. Vaughan
Pressure-regulating system....F. B. Comins
Printer's furniture....J. C. Urbank
Printing-machine, 2 pats....H. A. W. Wood
Printing machine, Stencil-..L. W. Von Behren
Projectile for throwing shot-lines....D. Bucci
Propeller-wheel....G. B. Davis
Protectograph....J. Huizenga
Pulley, Expansible....R. E. Rosewarne
Pulley, Expansible....C. F. Benjamin
Pulverizer, Clod-....W. Devoll
Pump, Centrifugal....R. Salzer
Pump, Rotary....L. C. Robinson et al
Puzzle....W. J. Akin
Radiator pipes, Expansion attaching-plate for steam-....J. Auble et al
Rail-joint....J. R. Smith
Rail-joint....B. Koontz
Rail-joint....J. Bernhard et al
Rail joint and fastener....I. Johnson
Rail-joint nut-locking device....R. Richards
Rail-securing appliance....A. C. Smith
Railway bumping-post....J. A. Thomason
Railway current-collector, Electric-....P. Pforr et al
Railway-fender, Air-actuated....S. S. Johnson et al
Railway frog or crossing..C. W. Reinoehl et al
Railway-spike....J. E. Heale
Railway-switch....B. C. Froman
Railway-tie....C. E. Womer
Railway-tie....J. C. Zimmerman et al
Railway tie, fish-plate, and car-replacer, Combined....W. W. Gordon
Railway-track and metal cross-tie..J. H. McCoy
Railway turn-table, Overhead-....C. H. Witthoefft
Railways and tramways, Brake for rolling-stock of....A. W. Maley
Ratchet-wrench....W. L. Zeller
Razor-hone....S. Santino
Razor, Safety-....R. H. Reed
Razor, Safety-....J. Hartness
Razor, Safety-....M. G. Bunnell
Receiver and damper-regulator, Combined....D. A. Midgley
Refrigerator-car....C. A. Moore
Regulator, 2 pats....O. Saugstad
Resilient wheel....S. S. Childs
Revolving wrench....K. Weiss
Ring-expander....F. O. Anderson

Rock-drill....C. J. Smith
Rock-drilling machine....J. B. Damas et al
Rotary engine....W. S. Ferguson
Rubber boots or shoes, Apparatus for molding, vulcanizing, and finishing...J. W. V. Mason
Rubber-dam holder and cutter....A. B. Prentis
Rubber-soled shoe....R. T. Badgley
Sack-tie....W. T. Oxley
Sad-iron....J. B. Morrison
Sad-iron heater....G. H. Gregory
Safety-pin....L. W. King
Sash-holder....E. E. Gabbart
Sash-holder and sash-lift, Combined....E. T. Robinson
Sawmill set-works....T. S. Wilkin
Scale-destroying composition....C. Ellis
Scraper for kitchen use....M. M. Kindred
Screw-cutting die-stock and die....S. S. Rider
Screw-driver....H. O. Harrison
Screw-slotting machine....E. C. Henn
Scroll-bending machine....V. W. Jewett
Seal, Bottle-....H. E. Erwin
Seal, Self-locking....I. C. Reesor
Seeder, Broadcast....F. A. Tuttle
Self-lubricating wheel....C. D. Sensenich
Sewing and embroidering machine....J. Fink
Sewing-machine feeding mechanism....C. V. Ericson
Sewing-machine thread-controlling mechanism....D. Mills
Shade and curtain-pole holder, Window-....C. M. Avery et al
Shaft-holder for harness....W. T. Schree
Sharpening machine, Cutter-tooth-....R. S. Brown
Sharpening-machine, Rock-drill....C. H. Shaw
Shed and chute, Combined hog...J. E. Wallace
Sheep-shears....F. N. L. Willett
Shipping-tag cord-attaching device....F. O. Rogers
Shock-loader....E. L. Griffin
Shoe-tree....H. A. Hayden
Shoe, Ventilated....G. Valiant
Sidewalk-ventilator....M. Carroll
Sifter....J. E. Mueller
Sifter and strainer, Combined....J. C. Bowe
Sign....G. J. B. Rodwell
Signals, Electrical apparatus for transmitting....C. Salmon et al
Size-determiner....H. Goodwin et al
Skelp-cleaning apparatus....H. W. Hock
Skirt-placket....F. Canfield
Smoke-bell....G. A. Milholland
Smoke-consumer....J. Ryan
Smoke-preventing furnace...A. W. Puddington
Snap-hook....J. B. Calvert
Soap, Cooling....F. Jürgens
Spanner, Adjustable....G. Roberts
Speed device, Change-....D. E. Ross
Spinning, Machine for preparing fibers for....M. Collins
Spraying device....A. M. Phillips
Sprinkling apparatus, Road-....B. Kortas
Stamp-holder....O. F. Jaeger
Stationery-holder....E. P. Lynch
Steam-engine....C. Ferrari
Steam-pipes, cylinders, &c., Means for covering....W. I. Sutcliffe
Steamer, Head and face....R. M. Henry et al
Still for treating recovered grease....C. Ellis
Stool, Piano-....A. B. Hanson
Storage-bin....F. R. McQueen
Stove, Cooking-....E. Senn
Stove-lid and pot lifter....G. Mayer
Stoves, Match-plate for forming parts of....L. W. Van Cleave et al
Stovepipe-anchor....M. H. Welton
Street-indicating device....T. W. Small
Stud to be used in the construction of non-skidding bands and tires, Compound....C. Payne
Stuffing-box....J. C. Young
Surgical splint....C. A. Walker
Sweat-band....T. J. Asch
Table....J. E. Long
Tailor's appliance....I. Geraci
Telegraphone....H. Schütte
Telegraphy receiver, Wireless-....G. Marconi
Telephone apparatus....J. H. Thompson
Telephone call-register....B. B. Brockway
Telephone-switchboard apparatus....L. A. Brinkman
Telephone system....C. L. Goodrum
Thermometer and other similar device having saturated vapors....J. B. Fournier
Thermostat, Differential....W. H. Carrier
Thread-cutter....N. Zogg
Thread-cutting temple....E. M. Main
Thread-holder....J. Rosenberg
Thresher-concave....M. Flynn
Threshing-machine....T. G. Branaman
Tile....F. W. Garrettson et al
Time-detectors, Key for watchmen's....P. Moosmann
Tire....W. Porter
Tire-upsetter, punch, and shear machine....J. F. Badger
Tobacco material, Recovering nicotin from....G. B. Lindenberger et al
Tool, Combination-....W. Jones
Tool, Combination-....C. W. Reynolds
Tool-handle....E. L. Latimer
Toothpick-machine....W. F. Hutchinson
Top, Spinning-....I. L. Davenport
Toy, Musical....J. D. Harper
Track-walker's implement....J. A. Blauch
Train-stop, Automatic....H. G. Sedgwick
Traveling-case....A. Gray
Traveling-grate furnace....H. A. Poppenhusen
Tray....L. A. Wincbell
Tray, Instrument-....C. F. Booth
Trolley, Electric....J. Young
Trolley-pole....L. C. Collins et al
Trolley-wheel to the wire, Means for automatically restoring a....C. F. Mebl
Truck, Combined drag and carrier-....T. K. Barley
Truck, Hand-....J. C. Moore
Tweezers and blackhead-remover, Combined...A. L. Tolman
Twine-making machine....L. J. Monahan et al
Tympan-sheet....J. Fraser
Type, Printer's....A. W. Hanigan
Type-writer....F. J. Dyett
Type-writer table and desk...G. A. Rausch, Jr.
Type-writing machine....J. Felbel
Type-writing machine....C. B. Yaw
Type-writing machine....E. E. Barney
Umbrella, Folding....J. J. MacCready
Universal joint....F. H. Bogart
Unloading apparatus....A. F. Burt et al
Vacuum-actuated screen....H. G. Shortt
Valve....H. J. Criner
Valve, Electrically-operated....C. Krämer
Valve, Explosive-engine....P. Schramm et al
Valve, Relief-....F. Schreidt
Valve-remover....B. A. Swenson
Valve, Steam-engine reverse-....W. E. Rickey et al
Vaporizer, Perfume-....E. J. Keefer
Vat and cage controlling and protecting means....E. Fleming
Vault, Cement burial-....W. H. Marshall
Vehicle controlling mechanism, Motor-....F. D. Howe
Vehicle, Electrically-propelled....L. Krieger
Vehicle guard or fender....C. W. M. Guhle
Vehicle, Motor-....E. G. Hoffmann
Vehicle, Motor-....J. C. McCurry
Vehicle, Motor-....W. Christie
Vehicle-seat, Removable....J. M. Dixon et al
Vehicle-top bows apart, Clamp for spacing....F. L. Paxson
Vehicle-wheel....J. De Vere et al
Vending-machine....H. W. Nicholes et al
Vending-machine, Coin-controlled....F. W. Gerlach et al
Ventilator....F. F. Stokes
Voting-machine....J. W. H. Doubler
Wagon-bolster, Spring....J. L. and A. Hagel
Wagon-brake....G. H. Kanke
Wagon, Dumping-....W. O. Long
Wagon-seat....P. J. Luthardt
Wardrobe, Knockdown....N. Swanson
Washing-machine....O. R. Miller
Washing-machine, Laundry....E. Lommatzsch
Washing-machines, Cover-fastening means for use on....P. A. Folk
Watch, Chatelaine-brooch....C. L. Depollier
Watchcase....W. H. Fitz Gerald
Water-closet tanks, Fitting linings for..C. Pfau
Water-motor....L. Fossee et al
Water-motor, Impact....W. A. Doble
Weaner, Calf-....A. W. Swender
Weather-strip, Door....W. Malott
Weeder....J. C. Wenner
Weighing device, Liquid-....W. A. Wallwork
Weighing machine, Grain-...B. M. Steele et al
Weight or follower....J. B. Boring
Welding-machine crimping apparatus, Electric-....H. L. Smith
Welding-machine, Electric....L. S. Lachman
Welt-attaching apparatus....G. Goddu
Wheelwright's machine....J. R. Richmond
Wickless burner for liquid combustibles....C. Hennig
Winker-fork stays, Fastener for...E. B. Knapp
Wire fabrics, Rack for holding rolls of....J. T. Sappenfield
Wood-preserving composition....H. Stokes
Wrench....T. Atzenweiler
Wrench....H. L. Beck
Wringer....F. Hardy
Writing-machine....E. B. Hess
Zinc hydrosulfite, Making stable....M. Bazlen et al

DESIGNS.

Lantern, Projecting-....J. E. Lagergren
Light reflector, Artificial-....K. Booth
Light shade or globe, Artificial-....K. Booth
Ring....H. Leiser
Sugar or confectionery tongs....L. Fritzsche

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MECHANICAL PATENTS.

Addressing-machine....C. A. Belknap
Advertising device, Wheel....J. P. Bergeron
Advertising-directory....S. H. Martel, Jr.
Agar-agar-cascara product and making same....K. Dieterich
Air-brake system, Electrically-operated....W. C. Mayo
Air-ship, Dirigible....H. L. Malécot
Alarm system and apparatus....J. M. Latimer
Alarm transmission....J. M. Latimer
Amusement apparatus....C. I. Matson
Annunciator....E. Baum
Automatic switch....W. R. Jenney
Automatic switch and signal....M. I. Haulter
Axle, Compound vehicle-....S. H. Preston
Bag-filling machine...J. C. and H. M. Sturgeon
Bag-holder....H. Lane
Baggage-check....D. C. Pullins
Baking appliance, Biscuit-....W. E. Williams
Baling-press elevator....W. Parker
Ball journal and thrust bearing...F. W. Witte
Barrette....W. S. Bechtold
Bath apparatus, Air-....F. S. Betz
Battery charging system, Storage-..F. B. Corey
Beer-case seal-lock....F. B. Williams
Belt-fastener....V. E. Lindberg et al
Belt guide and shifter....D. Halliday
Belt-guide, Automatic....E. H. Gregory
Bevel....O. S. Messner
Biscuit, Shredded-wheat....W. E. Williams
Boat, Torpedo-....E. J. Kelley
Boiler-tube press....J. C. Tassey et al
Bolster, Body-....O. S. Pulliam
Bolt-anchor, Expansion....H. W. Pleister
Bolt-fastening device....A. V. Bryce
Bolt-operator....W. W. Meyer
Book....J. C. Dawson
Book, Manifolding sales-....L. G. Whitney
Boring-machine....W. C. Sims
Bottle....J. B. Reily
Bottle....J. J. Piper et al
Bottle and cup, Combined....F. N. Ferry
Bottle-closure....J. M. Cumming
Bottle-fastener, Lock....M. D. Ransom
Bottle holder, Nursing-....W. R. Turner
Bottle, lamp, and cup, Portable combination....E. Gerbrecht et al
Bottle, Non-refillable....M. Ecker
Bottle with adjustable discharger....P. Rosenkaimer
Bow-tie, Detachable....A. Swanson
Box....J. G. Smith
Bracelet....P. L. Hansen
Brake appliance, Safety....O. H. Black
Brake-setter....W. A. Rideout, Sr.
Brooder heating-tank....G. E. Merritt et al
Brush drilling and tufting machine....E. F. Buch et al
Bucket, Grab-....H. P. Andresen
Buckle, Cross-line....L. D. Koch
Buckle-shield....F. C. Paegel
Buoy....F. H. C. Heyn
Burglar-alarm....J. A. Smith
Butter-cutting machine....S. B. Friday
Button-blank-cutting machine....N. Barry, Jr.
Cable-terminal....F. B. Cook
Calculating-machine....H. E. Goldberg
Calculating-machine....J. C. Wahl et al
Call apparatus, Selective....J. A. Hulit
Camphene, Making....C. Weizmann
Can-opener....F. P. Gorin
Canal, Pleasure-....M. Rosen
Canceling-machine....E. M. Hill
Canes, &c., Machine for bandling....E. Powell
Car-coupling....J. Tessier
Cars, Means for operating the doors of hopper-bottom....W. S. Atwood et al
Cars, Mechanism for controlling air and sand on....C. Spicer
Carbureting air for explosive-engines....A. Winton et al
Card holder, Information-....J. H. Healy
Case and voting-machine, Combined....J. F. Connelly et al
Casing-spear....M. W. Carroll
Cement-applying mechanism....P. R. Glass
Chain, Linked....A. Speidel
Churn....P. B. Cupp et al
Cigar-holder for hats....F. L. Short
Cigarette-box....G. B. Mosley
Cigarette-tubes, Machine for making mouth-piece....M. Himoff
Circuit-breaker contact....W. M. Scott et al
Circuit-closer, Safety....L. Ottinger
Clevis....T. J. Davis
Clock, Alarm-....E. B. Lapham et al
Clock, Alarm-....E. McComb
Clock mechanism, Electric....G. H. Rupley
Clock winding mechanism, Electric....G. H. Rupley
Closing box....J. M. Walcutt
Clothes-line reel and stretcher....C. S. Sears
Clothes-rack....J. E. Morris
Clutch mechanism....A. J. Winegar
Clutch or the like, Electrical....A. P. Steckel
Coal-handling apparatus....J. E. Richards
Coin-controlled box....C. A. Shattuck
Coin-delivering apparatus....A. Gauss
Coin-wrappers, Machine for making....H. R. Radford
Collar-fastener....J. Wittner
Collar-fastener....A. H. Zima
Combination-lock....F. Soley
Combustible materials, Gasification of raw....P. Hoaring et al
Combustion of fuel, Controlling the, 2 pats...H. J. Williams
Computer....R. D. Burhans
Concrete, &c., Apparatus for molding conduits in....D. L. Hough
Concrete construction, Tension and supporting member for....J. Tuteur
Conduit, Reinforced monolithic....J. M. Boyle
Control system....E. W. Stull
Convertible chair....I. H. Yaffe
Conveying apparatus....T. S. Miller
Cooking utensil....G. H. Bruce
Cooking utensil....L. E. Daniels
Coop, Folding....A. C. Segessemann
Cork-puller....H. S. Thompson
Corn-husking machine....W. D. Nelson
Cotton-handling apparatus, Seed-...J. T. Fuller
Crate, Folding egg-....T. W. Kendall
Cross-tie....L. A. Dellea
Cultivator....W. A. Hancock
Cultivator....C. W. Michael
Cultivator attachment....E. J. Brooks
Cultivator, Disk....F. J. Lewis
Cultivator, Harrow-....H. C. Farris
Currents, Generating and distributing alternating....E. B. Raymond
Currents, Means for generating and distributing alternating....E. B. Raymond
Curtain-fixture....P. A. Houghtaling
Curtains or shutters, Support for rolling....E. H. McCloud
Cutting-machine....A. F. Preston
Dandelion-killer....J. S. Foulke et al
Dental sterilizer and water-heater....E. G. Stamper
Disinfecting apparatus....P. Rudisch
Display-box....H. G. Kuck
Display-box for flower-seeds....F. G. Merritt
Door-catch....P. Forg
Door fastener, Sliding-....G. M. Ingebo
Door-securer....E. M. Hembree
Doubling and spinning, Device for preventing singles in....H. C. Nightingale
Dough dividing and molding machine for bread....E. J. Diener
Draft-coupling....H. M. Trankle et al
Dumping-pan....T. Watkins
Dust-guard....P. J. Harrigan
Dye, Yellowish-brown sulfur....B. Jaeckel
Egg-beater....W. C. Kamerrer
Egg-boiler....R. E. Deane et al
Egg-tester tray....G. W. Newton
Electric-conductor conduit...A. E. Woodhouse
Electric furnace....J. Härdén
Electric machine, Dynamo-....M. R. Hanna
Electric-machine regulator, Dynamo-....W. C. Mayo et al
Electric metering system....E. Schattner
Electric motor....W. Shurtleff
Electric regulator....T. M. Pusey
Electric snap-switch....J. G. Peterson
Electric-wire conduit....H. C. Freeman
Electrical apparatus....C. J. Klein
Electrical conducting-cord....G. F. Atwood
Electrical-system protective device....K. Kuhlmann
Electrode, Lightning-arrester....F. B. Cook
Electrodes and preparing the same, Metallic film for use with storage-battery....T. A. Edison
Electromagnetic switch....W. MacMillan
Electromagnets, Construction of...A. F. Berry
Elevator safety-brake....C. F. Bath
End-gate fastener....J. H. Halder
Engine spark-plug, Internal-combustion-....H. C. ter Meer
Excavating-machine....W. Clemow
Exhibitor....H. Peterson
Explosive....C. E. Bichel
Extension-table....C. Wiefelspuetz
Facing-tool and counterborer, Combined....B. M. Weller
Feed, Boiler-....D. Goff
Feed regulator, Thermostatic boiler-....O. O. White
Filaments out of viscose or similar viscous material, Forming....C. A. Ernst
Film-handling device....T. S. Graves
Filter, Oil-....A. Bowe
Fire-extinguisher....E. T. Robinson
Firearm....A. E. Lard
Fireproof-building floor and ceiling construction....L. Hermann
Fluid-circulating roll....I. E. Palmer
Fluid-level indicator....C. Brent
Fluid-mixing apparatus....W. F. Traudt
Fluid-pressure brake....W. V. Turner
Folding table....H. L. Haskell
Food materials, Preparing....W. E. Williams
Foot-rest....J. Flindall
Footwear....F. H. Addis
Footwear....R. Christensen
Frame construction, Side-....O. S. Pulliam
Freezer dasher, Liquid-....G. M. Mills
Furnace bosh-jacket and bosh-plate....F. C. Roberts
Furnace-port-cooling-means...F. E. Parks et al
Furniture, Dressing-room....P. O. Eekhardt
Gas and oil from fluids, Apparatus for separating....E. J. McCabe et al
Gas-burner air-mixer....C. H. Henzel
Gas-burner ignition device....G. W. Graves
Gas-fixture attachment....I. Kates
Gas generator, Acetylene-....C. W. Beck. (Reissue.)
Gas-making apparatus....J. M. Conway
Gas manufacturing....H. W. Benner
Gas-producer....F. Powell
Gear, Transmission-....P. Hayward
Gearing, Transmission-....W. C. Mayo et al
Glass sign....P. Pause
Grader, drag, &c., Combined road....T. H. Mitebell
Grain-separator....H. A. Campbell
Grass-burning machine....J. R. Totman
Grate-bar....G. S. Sergeant
Grinding-mill register and alarm....J. M. Hiekey
Harrow....J. E. Robinson
Harrow, Disk....J. Macphail
Harrows and the like, Seat for....M. Buzard
Hat and coat rack....A. W. Lawrence
Hay-loader....A. H. Bosworth
Hay-press, Self-feeding....G. Schubert. (Reissue.)
Headlight....R. A. Bell et al
Heating systems, Pressure-regulator for water-....C. Phelps
Heel-seat-forming machine....S. J. Wentworth
Hollow ware, Method and mold for making....G. H. McKee
Hook and eye....S. C. Glidden
Hoop for exhibition purposes..H. W. Crichton
Horse-power-hour meter....J. Picht
Horseshoe, Cushioned....P. Clifford
Hot-box indicator....H. Williams
Hot-water-main fitting....E. A. Schenck
Hydrocarbon-burner....B. C. Hamilton
Ink-well, mucilage-bottle, &c., Automatic-font....J. B. Ramirez
Insecticide....H. S. Delamere
Instep-arch support....W. M. Scholl
Insulating-wall....G. Walzel
Insulator....J. P. Nikonow
Internal-combustion engine....D. Clerk
Jeweler's solder-cutting machine....G. Lieb
Journal-box....G. W. Lewis
Journal-box for hay-loaders..F. A. Hanenberger
Keg-handling device, Beer-....F. J. Donoughe
Keyboard instruments, Mecbanical player for..W. Pape
Knife-guard for meat-slicing machines....A. Roest
Knife-wiper....F. A. Pettit
Ladder, Step-....E. Rowe
Lamp, Acetylene-gas-generating....E. M. Rosenbluth
Lamp, Arc-....L. Ocenásek
Lamp, Electric incandescent....H. Kuzel et al
Lamp-shade holder....J. Cruikshank
Lamp, Vehicle-....C. Bergener
Lantern-holder....C. A. Knapp
Leather-belt-scarfing machine.E. H. Hathaway
Lifting device....R. W. Cash
Lifting-jack....J. F. Hale
Lifting-jack, Motor-car....I. P. Nelson et al
Lightning-arrester....K. Kuhlmann
Liquid-dispensing apparatus.W. C. Mayo et al
Liquids, Electrochemical concentration of....G. W. Nistle et al
Lock for vault-covers and other closures....J. Armstrong
Logs, apparatus for injecting chemicals into....S. Willner
Loom, Weft-replenishing....J. W. Carr
Loop-the-gap apparatus....M. Garanger
Lubricator....C. W. Hogdon
Lubricator....C. Comstock
Mail-bag catcher and deliverer...R. H. Nolan
Mail-bag catcher and deliverer..E. C. Burnette
Mail-bag catching and delivering device....E. M. Spotts
Mail-bag delivering and receiving apparatus....A. Winegardner
Mail-bag delivering apparatus....M. A. Beard
Mail catcher and deliverer....A. C. Rommel
Mail marking or canceling machine....F. C. Ielfield
Mail receiving and delivering apparatus....S. Denney, Jr.
Malting process....A. Oertel
Mash stirring and filtering apparatus....A. Hellwig
Mashing-machine....A. R. Keller
Message device, Vibratory..A. H. Arnold et al
Mattresses, pillows, comforts, &c., Machine for making bats for....T. J. Underwood
Measuring appliance, Distance....R. Straubel
Measuring lengths of fabric, Apparatus for....A. M. Casperson
Meat-tree....G. E. Richmond
Medicine-dropper....H. I. Owen
Metal-cutting shears....C. E. Weeks
Metal matrices, Making....E. Albert
Metal-plate-edging machine....J. Fraser et al
Meter....W. J. Lloyd
Milk-can....A. J. Eden
Milking-machine....E. V. Gandil
Mold....C. H. Lawton
Molding-machine....W. L. La Rue

Motor-driven reciprocating devices, Control system for....L. Janisch
Motor-generators, Field regulation for....C. E. Eveleth
Motor mechanism, Spring..C. H. de La Monte
Music-sheet, Perforated....H. K. Sandell
Musical instrument, Automatic....R. B. Fowler
Musical-instrument hand-support....D. E. Hartnett
Needle, Turfing-....S. H. Ferrier
Nut-lock....J. J. Bailey
Nut-lock....H. Dubrow et al
Nut, Lock-....H. L. Smith
Nut, Lock-....J. L. Kalmbacher
Oil-cup, Automatic....O. Damon et al
Ore-concentrator....F. E. McKinley
Ore-separator....J. G. Evans
Ore-treating apparatus....W. C. Tracy
Packages, Metallic reinforcing means for....G. H. Millen et al
Packing for gas-engine valve-stems....A. K. Schaap
Packing-machine, Automatic....J. A. Gray
Padlock....S. H. Manning
Pan cleaning and greasing machine....H. Gottschalk
Pan-cleaning device....H. Gottschalk
Parer, Apple-....D. F. Hunt
Paring-machines, Slicing and coring attachment for....J. F. Kohler
Pasteurizing apparatus....F. Tyson
Paving or building blocks, Preparing....R. C. Gangeware
Pea-grader....A. Brubaker
Pen and pencil holder....W. R. Crawford, Jr.
Pen-filling apparatus, Fountain-....P. J. Sullivan
Pen, Fountain-....W. A. Sheaffer
Pencil attachment....R. L. Nichols et al
Percussive tools, Automatic fluid-actuated feed mechanism for....D. S. Waugh
Perforator, Non-synchronous receiving-....M. T. Weston
Phonographs, Mechanism for driving the diaphragms of disk....E. C. Boulanger et al
Photographic developing-machine....T. S. Graves
Piano-action....F. Schimmel
Piano-case top, Grand-....G. L. Bailhé
Piano-player, Electric....T. B. Powers. (Reissue.)
Picture-frame....J. F. Hawkes
Pin....G. W. Dover
Pipe coupling, Train-....A. S. Parsons
Pipe-wrench....F. Ioset
Piston....G. H. Stallman
Pitcher or holder, Molasses....V. B. Nuckols
Plant-stake....E. Austin
Plant-support, Wire....O. A. Müller
Planter, Corn-....C. W. Michael
Planter marker attachment, Corn-....C. A. Mehaffey
Planter, Seed-....W. F. Rodies
Plaster-board....J. J. Ryan
Policeman's club, Flexible....J. T. Gannon
Presses, Drawback mechanism for....W. Astfalck
Pressure brake, High-....W. V. Turner
Pressure-maintaining system....F. Gray
Printer's chase foot-bar....T. F. Murray
Printing-blocks, Manufacture of half-tone....W. and H. B. Bell
Printing device....C. F. Shepherd
Printing machine, Multicolor-....F. W. H. Dietrich
Printing, Multicolor-....J. P. Knapp
Printing-press....F. Meisel
Printing-press attachment....M. Rockstroh
Printing-press web-guide....R. Mason
Propeller....W. S. Hull
Pulping-engine....J. Nuttall
Pulverizing machine, Ore-....F. W. Thomson
Pump or inflater, Air-....F. S. Nickells
Pumps, &c., Strainer for....J. A. Mensch
Puncture-closing device....S. Mundey
Puzzle....H. D. Gardy
Puzzle....J. R. Johnson
Puzzle....C. B. Graves
Rack....J. H. Brown
Radiator, Portable hot-water....W. R. Kinnear
Rail-fastening....A. Newell
Rail-joint....J. Farrell
Rail-joint....H. J. Rickard
Rail-joint....W. H. Durell
Rail-joint....L. T. Stephenson
Rail-joint....H. Walker et al
Rail, Rack-....F. L. Sessions
Rails, Crossing or connection for....W. D. Smith
Railway device, Amusement....E. H. Skinner
Railway-rail....E. Gathmann
Railway-rail anticreeping device....D. F. Vaughan
Railway-rail anticreeping device....D. F. and D. L. Vaughan
Railway signaling apparatus....W. Macomber
Railway-tie....G. W. White
Railway-tie....J. D. Hazlet et al
Rake....H. B. Sperry
Range-keeper....A. T. Dawson et al
Ranges, Illuminating and igniting attachments for gas-....C. H. Gatcheli
Rectifier-panel....S. Ferguson
Refrigerator....G. F. Schrader
Register or ventilator....J. H. Bailey
Rein-holder support....T. V. Wallace
Reinforcing-frame....H. E. White
Relay, 2 pats....F. L. Dodgson
Rendering and drying plant..J. Goeppinger et al
Respirator, Mechanical....A. N. Habberley
Ribbon-reversing mechanism....F. A. Hart
Ribbon-shifting mechanism....C. Spiro
Rock-drilling engine, Gas-operated....R. S. Trott
Rope-socket, Ratchet-swivel....C. Daniel
Rotary engine....C. H. Luther, Jr.
Sad-iron holder, Inverted-....J. Shelton
Safety-pin....S. Pearl
Sash-lock....G. S. Prior
Sausage-machine....F. Matheyer
Scarf-pin or similar article...A. W. Rothschild
Screw-cutting die-head....A. E. Church
Screw-positioning implement....W. A. A. Johnston
Secondary battery....L. Fiedler
Self-tightening joint....J. Heber
Separating-machine....W. A. Trescott
Separating mechanism....J. F. Senter
Separating-machine for lignin, cellulose, and the like, Horizontal centrifugal....P. Priem
Sewer-cleaning apparatus....J. Kelly
Sewing-machine felling attachment....G. J. Stevens
Sewing-machine grinder attachment....W. E. Graves
Sewing-machines for blindstitching, serging, overseaming, and the like, Attachment for....G. J. Stevens
Shade and curtain bracket, Combined....F. J. Grote
Shade bracket, Adjustable window-....F. Ferrara
Shade-roller....C. O. Bulock
Shafts, Vehicle-....F. S. Howells
Shank cutting, molding, skiving, and forming machine....S. B. Tompkins
Shank-machine....E. H. Taylor
Shelf-supporting bracket....J. P. Eustis
Shipping-box....W. R. Stokely
Shirt....J. Pollak
Shoe-shank support and shoe....W. Thompson
Side-delivery rake and tedder, Combined....J. D. Baker
Signal system....R. Pfeil
Signaling....M. H. Hovey
Silk and making the same, Consolidated natural....P. Schmid
Siphon structure....J. Maddock
Slack-adjuster....F. L. Clark
Slicer....E. F. Smith
Smoke purifying and consuming apparatus....W. Cyr
Soap-distributing machine....H. Robinson
Soda-water fountain....B. Spinelli
Soldering-machine for commutators...H. Stone
Sound-records, Making....W. H. Hoyt
Sound-reproducing machines, Repeating mechanism for....J. H. Stinson
Spacing-table....H. A. Feindt, Jr.
Spoke-socket, Sheet-metal....F. S. Loockerman
Spraying apparatus....H. F. B. Snyder
Square, Carpenter's bevel-....C. M. Hoeregott
Stake-holder....A. J. Bostwick
Stamp-mill, Rotary....P. J. Lonergan
Stamping and franking letters, telegrams, &c., Machine for use in....E. Moss
Steam-trap....C. E. Fagan
Steam-trap....W. F. Sayles
Steel sheet, Composite coated....E. Norton
Steering-gear....T. Mayhew
Sticker-head attachment....J. Kridler
Stock-releaser....J. A. Cahil
Stone-sawing machine....J. Wegner et al
Storage battery....T. A. Edison
Store-service apparatus....C. W. McCormick
Strain-equalizer....J. W. Wash
Strainer, Liquid-....D. H. Mosteller
Street-cleaning push-cart....J. H. Byram
Strip-serving device....H. P. Roberts
Stuffing-box....A. E. Taylor
Supporting or display rack or stand....M. E. Hill
Tack puller, Lasting-....L. V. Miller
Tags and automatically attaching them to plugs of tobacco, Machine for making....W. E. Martin
Tank alarm, Pressure-....J. M. Latimer
Tantalum, Hardening....W. von Bolton
Tap, Collapsible....A. Granstrom
Tapes of paper or other material, Holder for....A. A. Grand
Telephone apparatus....S. A. Beyland
Telephone-exchange system....H. G. Webster
Telephone-meter....N. H. Holland
Telephone repeating apparatus, Circuit system for....H. E. Shreeve
Telephone-signal....C. Mahler
Telephone-switchboards, Spring-jack for....G. Grabe
Telephone system....J. J. Kelly
Telephone system....A. H. Weiss
Telephone system, 11 pats....H. G. Webster
Telephone-transmitters, Appliance for use with....O. H. Goodrich
Testing-device selective mechanism....A. B. Herrick
Thermometer-holder....L. R. Edwards
Thermostat....J. Nelson
Threshing-machine....W. Stephenson
Ticket holder and cutter for ticket-agents....A. D. Joslin
Ticket-record and train-check, Manifolding....J. O. M. Seibert
Ticket-selling machine....W. C. Mayo et al
Ticket-transfer....C. D. Meneely
Tile-handling apparatus, Drain-....E. Raye
Tiling-tool, Adjustable....C. W. Young
Tilting bin....E. H. Grant
Tire, Automobile or vehicle....G. Knadler
Tire, Pneumatic....W. C. and L. T. Rocheleau
Tire-pump....J. A. Dyblie
Tire tread-grip, Vehicle-....C. L. Hoff
Tongs, Grappling-....T. T. Shaw
Tool, Combination-....W. B. McCarty
Tool, Pneumatic....W. H. Keller
Tooth-cement, Production of....F. Schoenbeck
Toy and educational block, Combination....O. S. Perkins
Track-brake, Electric....W. C. Mayo
Track-level....B. F. Young
Tram-lines, Shifting-point for....O. Coates
Transformer-core construction....J. J. Frank
Transmission mechanism....C. E. Duryea
Tray-tool....E. Ekstrom
Trolley-wheel, Roller-bearing...W. L. Cooksey
Truck, Car-....W. C. Mayo
Tube-cleaner....J. G. McCarren
Tube receiving or delivering mechanism....W. R. Webster et al
Tubes, Method and apparatus for making....H. W. Hock
Turbine....J. O. Purvis
Turbines, Stuffing-box for elastic-fluid....G. Belluzzo
Turn-table-operating mechanism....C. E. McWade
Turpentine-cup....E. A. McKoy
Twine machine, Grass-....K. Wessel
Type-casting machine....A. W. Hanigan
Type-writing machine....B. A. Brooks
Type-writing machine....O. Woodward
Type-writing machine....E. E. Barney et al
Type-writing machine....W. W. Hopkins
Type-writing machine....E. C. Dunbar
Type-writing-machine ribbon-feed mechanism....E. B. Cram
Type-writing machine....W. E. Barnard
Umbrella, Foldable....J. E. Hannon
Umbrella, Folding....T. J. Dague
Umbrella runner and notch....W. M. Seitzinger
Uterine supporter....G. Beck
Valve....F. Freeman
Valve alarm attachment....R. F. Spamer
Valve, Flushing-....W. H. Ludewig
Valve for hydraulic machines....W. Astfalck
Valve mechanism, Flushing-tank....W. H. Ludewig
Valve mechanism, Sand-....D. T. Barnett
Valve, Relief-....F. C. Roberts
Valve, Steam-engine....F. M. Rutledge
Vehicle canopy-top....J. E. Smith
Vehicle, Motor-....T. L. and T. J. Sturtevant
Vehicle-wheel....H. Cramer
Vending-machines, Coin-way for..H. J. Wissing
Veriscope....W. H. Ely
Vessel, Containing and dispensing..C. F. Kade
Vessel, Turret....C. D. Doxford
Violin....P. A. Amundson
Violin or other string-instrument body....S. Ulbrich
Violin-rest....A. A. Goldenberg
Vise, Bench-....O. A. Anderson
Voting-machine....C. W. Bowron
Vulcanizer....J. F. Hardy
Wagon-brake....W. P. Heath et al
Waist....E. M. Shively
Wantage-gage....M. A. Rutenber
Washing-machine actuating mechanism....J. Edens
Washing-machine gearing....A. F. Victor
Watch-pocket, Safety....M. E. Brown
Water-gage....T. R. Whittaker
Water-gage....S. Donnersberg
Water-heater, Electric....J. R. Ayotte
Water, Purifying and filtering....A. Vogelsang
Water-wheel....W. P. Spooner
Wells, Gas-trap for oil-....R. C. Baker
Wind-wheel....A. M. Pacey
Winding machine, Quill or cop....E. E. Bradley
Windows, Construction of wrought-iron....A. Filzamer
Wire-stretcher....C. M. and H. A. Ruggles
Wire-stretcher....W. G. Matson
Wood-trimming machine....E. P. Webster
Wrapping thread, braid, &c., Card for....R. W. Strassberger
Wrench....R. F. Bowers
Wrench....G. Ebenhoch
Writing-machine....J. R. MacGuffie
Yoke, Neck-....H. L. Kingsley

DESIGNS

Badge....T. Metzeler
Badge....H. Zink
Brooch....F. Deman
Brooch-pin....H. W. Fishel
Brushes, mirrors, or similar articles, Back for....H. J. Herbert
Mirrors, brushes, or similar articles, Back for....H. J. Herbert
Picture-frame....F. Jandt
Sign, Street-....E. J. Bliss
Telephone-cabinet....A. Larsson
Type, Font of....T. C. Robinson
Watch-fob....C. H. Bunting

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MECHANICAL PATENTS.

Abrading-machine....A. W. Roovers
Acid baths, Preparing carbonic-....P. G. Lebram
Adding-machine resetting device....J. J. Walsh
Adding-machine stand....A. Hendricks
Advertising device for vehicles....M. F. Geserich
Air-brake safety device....J. Judge
Air-brake valve....D. S. Affleck
Air-ships, Controlling....M. Schiavone
Album....W. Thompson
Alloy for bearing metals....E. A. Touceda
Amusement apparatus....P. and J. Braen
Anchor, Shore-....J. J. Ryan
Animal-trap....G. McEachron
Animal-trap....C. Olson
Animal-trap....A. Menz
Antirattling device....A. S. Newton
Apron....C. W. Bartrum
Associating and collecting mechanism....H. A. W. Wood
Automatic trap....I. H. Peck et al
Automatic wrench....D. Rugg
Automobile....H. K. Holsman
Automobile-body, Convertible...E. T. Robinson
Automobile-brake....G. Stables
Automobile running-gear....J. W. Cooper
Automobiles, Disappearing luggage-carrier for....E. T. Robinson
Auxiliary heater....W. C. Richman
Awning....A. L. Penfound
Baker and broiler, Portable....W. C. Grant
Balance....J. Nelson
Basket and support therefor, Combined....C. Kuensting
Bathing-tub splash-pan....L. Matthews
Battery jar, Storage-....J. Marx
Beam, Metallic....F. C. Keighley
Bed-pan....D. A. Waltz
Bed, Vibrating....J. A. Seeber
Bedstead....H. W. Thompson
Bedstead, Metal....L. B. Snyder et al
Belt-shifting means....E. Wirth
Bicycle handle-bar....J. E. Brannan
Billet-heating furnace....C. J. F. Johnson
Billets, Heating....C. J. F. Johnson
Binder, Loose-leaf....L. Hill
Bit-brace wrench....B. R. Spaulding
Block-signal system....F. B. Corey
Block-signal system....L. A. Hawkins
Block-signal-system recording device..T. Haley
Block-signaling system, Electric....J. W. Davis
Boiler-furnace....O. U. Bean
Boilers, Apparatus for generating a solution for preventing incrustation in steam-....F. Brun
Boll-weevils, Device for killing..W. L. Rosson
Boots and shoes, Device for reshaping and reforming....E. C. Hawkins
Bottle....G. P. Dennis
Bottle-stopper....G. Kirkegaard
Box-fastener....F. Lenkey et al
Braid and other narrow fabrics, Packet for....C. S. King
Braiding-machine, 2 pats....J. Lundgre
Braiding-machine bobbins, Safety-regulator for....T. F. O'Bri
Brake adjusting apparatus, Railway-vehicle and like....V. Chavériat
Brake-beam strut and fulcrum....E. H. Bauer
Brick and tile cutting machine....W. R. Cunningham
Bridle-bit....M. Jincks
Brine-making apparatus....H. J. Gerner
Bucket, Automatic bottom-dumping and self-closing....H. G. Ferris
Bucket, Well-....D. S. Terry
Buckle....N. Fein
Buckle....F. W. Goerdes
Buffing and grinding apparatus....F. B. Duncan
Building-block, Cementitious....E. H. McClintock
Bulkhead and jetty construction....J. A. Howland et al
Butter-box fastener....G. E. Woodbury
Butter-molding machine....C. H. Prescott
Button cutting and shaping machine, Automatic....W. S. Watson
Calculating-machine....R. Rein
Calculating-machine....C. L. Nelson
Calipers....W. H. Watson
Calling-on signal, Automatic....W. H. Elliott
Camera....J. Goddard
Can-cover....F. S. Davis
Can crimping and soldering machine....F. W. Ballard
Can-filling machine....C. T. Small
Cane, Torpedo-....R. Bean
Cap-exploder, Magazine....G. Kruger
Car, Alcove sleeping-....F. E. Stebbins
Car, construction, 2 pats....F. E. Stebbins
Car-deck windows, Means for operating....W. J. McGrath et al
Car door, Grain-....J. Thompson
Car, Dump-....H. T. Herr
Car, Dumping-....R. H. Stevens
Car-fender....M. Bogushefsky
Car fender, Street-....D. H. and A. Brazil
Car-replacer....B. Strickland
Car, Sleeping-....F. E. Stebbins
Carbon-holder....O. A. Ross
Carpet-beater....A. W. Andrews
Carriage, Takeapart baby-....F. Turner
Carrier stop, Elevated-....A. H. Neller
Carton or display device....F. C. Ely
Cash-register....F. H. Bickford
Centrifugal mill....A. Raymond
Chain-drive, Flexibly-intermittent....I. W. Marshall
Chain, Friction drive-....W. J. Belcher et al
Chain guard, Watch and key....M. Richmond
Channeling-machine....E. A. Webster
Cheese-cover....F. A. Vogt
Chimney-cap....J. O. Myhre
Chuck, Drill-....T. R. Almond
Churn....W. C. Pease
Churn....S. P. A. Andersson
Cigar-lighter....C. A. Wagner
Cigar-lighter, Electric....E. P. Muller
Cigar-wrapper cutter and rolling table....B. Liberman
Cigarettes, Tool or apparatus for use in the manufacture of hand-made....L. Aptekman
Circuit-breaker, Automatic....H. P. Ball
Clam-digger....W. D. Collier
Cleaning and polishing apparatus....E. Haskell
Clip....A. B. McLean
Clothes pressing and cleaning apparatus....A. J. Hoffman
Clutch, Roller-....W. J. Olds
Clutch-throwing mechanism...J. G. Westbrook
Coal-bunker for men-of-war..H. A. Kauermann
Coat-hanger....F. M. Keederle
Cock, Waste and vent....J. H. Glauber
Coffee, Preparation of...J. F. Meyer, Jr., et al
Coffee, Treatment of....J. F. Meyer, Jr. et al
Collapsible chair....H. Goodrich
Commutator-motor, Single-phase....M. C. A. Latour
Concrete fence-post....C. Kubach
Condenser....W. B. Taylor
Controller-regulator....F. M. Du Bois
Conveyance safety device....F. W. A. Wiesebrock
Conveyer....A. D. Long et al
Coping-machine....J. R. Peirce
Copper homogeneous, Rendering electrolytic....M. A. Jullien et al
Cord-making machine....J. P. Tolman et al
Corn-sheller....A. H. Patch
Corset....C. L. Olmstead
Corset-waist....L. Nelson
Cotton-picker machine....A. St. Onge
Counting and canceling apparatus....A. Picken
Crate, Collapsible shipping-...W. E. Thoroman
Cuff-pin....J. A. Chaplin
Cuff-pin....A. Robertson
Cultivator....R. H. Heinze
Culvert and connection....J. H. Schlafly
Current motor, Alternating-....M. Milch
Current motor, Alternating-....E. F. W. Alexanderson
Curtain-pole....W. B. Little
Curtain-stretcher....T. H. Purple
Cushion....J. B. Kilburn et al
Cyclometer....C. L. Lilleberg
Cylinder-lock, Adjustable....H. G. Voight
Damper-regulator....H. Reaser
Derrick or hoisting means....R. H. Bowman
Desk-lock....W. J. Kennedy
Display-cabinet....O. T. Romsos
Display-closure....E. A. Pflueger
Door-check....M. J. Flynn
Door construction, Grain-....G. H. Behrendt et al
Door-fastener....H. C. Stenberg
Door operating and locking means, Cell-....R. C. and W. A. Stewart
Door support, Edgewise-movable....J. Joyce
Door tracks, Support for sliding-...J. Anderson
Driving mechanism....H. J. Gilbert
Driving mechanism, Variable-speed....H. M. Norris
Dust-separating apparatus....C. W. E. Bocgel
Dye, New disazo....O. Günther et al
Elastic material, Manufacturing....A. Adler
Electric-cable clamp....E. W. Muller
Electric-circuit time-switch....H. W. Brown
Electric controlling system....J. D. Ihlder-

Electric fittings, Terminal for.....F. A. Swan
Electric heat unit or device.....G. H. Wade
Electric installation, Conduit-cap for.....W. H. Vibber
Electric-light cluster-fixture.....J. H. Caldwell
Electric oscillations, Means for generating high-frequency.....R. A. Fessenden
Electric switch.....O. O. Rider
Electric switch.....F. C. De Reamer
Electric time-switch.....J. Cauderay
Electrical-distribution system.....M. O. Troy
Electrical impulse-recorder....A. K. Sloan, Jr.
Electrode and making the same, Arc-light.....C. F. Lindsay
Electrolytic cell.....G. C. Landis
Elevator.....C. D. Seeberger
Elevator and carrier.....W. Louden
Engine cooling device, Explosive-...R. Herman
Engines, Sparkless smoke-stack for traction-....A. Mathison
Envelop.....T. Lewis et al
Envelop.....G. W. Post
Exerciser.....A. Day
Exhaust, Under-water.....C. B. Chatfield
Expression attachment.....O. F. Hintz
Extensible post or prop.....R. H. McCombe
Eye-protector, Pneumatic.....A. E. Jacobs
Eyeglass-bridge.....S. C. Laflin
Fabric cover, Textile-.....F. B. Burns
Fan, Oscillating desk-.....E. C. Lipps
Fare-register-operating mechanism.....J. F. Ohmer et al
Feldspar flux, Making.....F. M. Locke
Fence-post.....A. Pagel
Fertilizer.....J. F. Jarboe
Fertilizer-distributer.....H. N. Harper
Fertilizer-distributer and cultivator, Combined..E. M. Cole
Fertilizers, Making.....J. R. Young
Fiber, Manufacturing indurated.....I. W. Marshall
Fiber, Soaking sheet.....I. W. Marshall
Fibrous stalks or plants, Producing a solvent for retting of bast.....M. H. Colahan
Filter.....A. J. Sheridan
Filtering apparatus.....B. M. Jäger
Finger-developing appliance.....F. Loyola
Fire-escape.....G. Lebri
Fire-hose pipe and analogous tubing, Automatic machine for winding...E. D. C. Bayne et al
Fireproof-window construction.....E. H. Lunken et al
Fireproof-window fastener.....C. H. and H. L. W. Hopmann
Firing-pin, Safety.....J. H. Wesson
Fish-trap.....W. L. Connevey
Flour from bran, Production of a digestible...T. Schlüter, Jr.
Fluid generator, Elastic-.....C. W. Dake
Flying-machine.....A. V. Wilson
Flying-machine.....W. Gordon
Food product, Nitrogenous.....K. Okazaki
Form, Shoulder-presser.....J. M. Stein
Furnaces, Drying air for blast-.....D. T. Day
Fuse plug and holder, Indicating.....C. E. Mentzer
Fuse, Safety-.....J. Sachs
Gaiter.....H. Cohen
Gallocyanins with amins, Condensing.....C. De la Harpe
Galvanic battery, Reversible.....H. C. Hubbell
Garment-clasp.....J. M. Siner
Garment-supporter clasp....D. De Lancey et al
Garment-supporter clasp.....J. F. Molloy
Gas and carbureting system, Combined producer-.....W. F. Steele
Gas apparatus, Acetylene-.....N. A. Renstrom
Gas cut-off, Automatic.....V. E. Campbell
Gas-generating plants, Appliance used in combination with.....A. L. Galusha
Gas-generator.....G. F. Silvey
Gas-lighter.....L. B. Prahar
Gate-operating device.....E. L. Booth
Gear, Short-turn.....R. H. Bowman
Glass tile.....S. Zacharias
Glove, 2 pats.....J. Rosenfeld
Governor, Electric and pneumatic.....W. K. Rankin
Grain and seed separator.....F. Prinz
Grain-cleaner for wild peas and cockle.....J. S. Christensen
Grain-tank.....C. Blom
Grease-cup.....C. H. Prescott
Gun, Air-.....B. B. Bennett
Guns, Recoil apparatus for..A. T. Dawson et al
Hair-drier.....M. Thome
Hair-pin holder, Sanitary.....B. E. Stephens
Hair-waver.....J. H. and I. Taylor
Halter.....T. W. Weber
Halter, Rope.....C. Walker
Hammer, Magazine tack-.....N. M. Purviance
Harness-pad.....E. J. Koch
Harvester cutter-bar.....W. S. Clark
Harvester, Pea-.....S. Nettleship
Hat-pin.....G. H. Ekstrom
Hay-rack.....C. Gillson
Heating apparatus.....J. N. Young
Heating system.....E. N. Fairchild
Heating system, Automatic steam-....F. Grote
Hinge, Gate-.....I. Lester
Hoist, Chain.....J. J. Stosick
Hoisting-machine.....W. M. Brown
Holdback or breeching strap.....G. F. Rice
Hose-nozzel cart.....E. J. Petru et al
Hydrant, Combination fresh and salt water....F. Malloye
Index.....E. Davis
Index and filing system.....J. F. Dunleavy
Ingots, plates, sheets, tubes, wires, and like products, Making bimetallic....J. F. Monnot
Insect-exterminator.....G. T. Patten
Insulating-coupling.....H. Ashbaugh
Insulator.....F. J. Siegwart
Iron and tin compounds from tin-plate scrap, Preparing merchantable.....E. A. Sperry
Jack.....W. F. McCullock
Jar-lid clamp.....F. R. Schriver
Jewel, Butterfly-.....W. D. and R. W. Denton
Jewelry safety-catch.....E. Liebert
Kettle-tilter.....E. Mousseau
Keyhole-guard and key-lock.....E. L. Medler
Knitted web, hosiery made therefrom, and making same, Narrowed-.....R. W. Scott
Labeling-machine.....M. E. Noyes
Lamp and the like, Marine signaling-.....H. Endall
Lamp-extinguisher, Automatic.....E. Brusseau
Lamp hanger, Electric-.....G. Cutter
Lamp, Inverted incandescent gas-....M. Graetz
Lamp socket, Cluster-.....C. D. Gervin
Lamp socket, Incandescent-.....W. F. Wegner
Lampblack-making apparatus.....G. Wegelin
Lasting-machine.....G. H. Clark
Latch.....E. Krafft
Latch mechanism.....P. Behr
Lathe tool-holder.....C. E. Keel
Lawn-trimmer.....H. Watkins
Lid-lifting attachment.....T. D. Logue
Lifting-jack.....C. Goble
Lightning-arrester.....C. P. Steinmetz
Lime hydrate, Apparatus for the production of.....W. Schulthess
Liquid-dispensing apparatus.....R. W. Elliott
Liquids, Apparatus for controlling the flow of.....J. W. Cox
Loader and hauler....B., Sr., and A. Overlack
Lock.....J. A. Curry
Lock and latch mechanism, Door.....B. Revoir
Lock construction.....H. G. Voight
Lock construction.....H. G. Voight et al
Locking device, Electromagnetic..C. O. Peters
Locomotive and street-car fender.....J. Rebar
Locomotive, Electric.....E. A. Sperry
Log hauling and loading machine.....E. W. Gerrish
Loom-dobby.....E. H. Ballou
Loom for the manufacture of tufted or pile fabrics.....T. Greenwood
Loom harness mechanism.....D. Lindsay
Loom thread-parting mechanism.....A. E. Rhoades
Looms, Filling-end holder for weft-replenishing.....J. C. Edwards
Looms, Filling-end holder for weft-replenishing, 2 pats.....M. L. Stone
Looms, Selvage-forming mechanism for short-weft.....F. E. Arrouquier
Looms, Shuttle-feeler for filling-replenishing...A. E. Rhoades
Looms, warping-machines, and the like, Mechanical warp stop-motion for weaving-.....J. Taylor et al
Lubricator.....P. Daimler
Lubricator.....R. Davidson
Mail-bag catcher.....P. F. Bergman et al
Mail-bag catching and delivering apparatus....O. O. Ayres
Mail-bag receiving and delivering apparatus....R. G. Cass
Mail catcher and deliverer.....J. C. Watts
Mail-crane.....J. Bour
Mall for driving posts into the ground.....T. R. Beard
Malleable handle.....P. D. Skahen
Malt-kiln.....W. H. Prinz
Mangle.....P. L. Brockardt
Marble and making the same, Artificial.....A. Riesch
Match-box.....W. Williams
Match-box, Single-delivery.....E. T. Murray
Match-safe.....F. O. Swenson
Match-safe.....E. A. Schneider
Matching mechanism.....P. E. Donner et al
Measuring device.....O. E. Dickeson
Mechanical movement.....J. T. H. Paul
Mechanical playing apparatus....W. F. Cooper
Mercury meter.....F. Holden
Metal-working machine.....R. T. Wingo
Metal-working tool.....C. L. Moses
Milk or cream and butter, Treating.....A. Fay
Miner's cap and lamp....L. W. Cogswell et al
Mining-machine.....G. Sánta
Mixing-machine.....W. O. Stark
Mop and wringer therefor, Combined.....E. Hilker
Motion-converting device.....J. E. Paulson
Motion of flexible diaphragms, Device for utilizing the.....W. M. Fulton
Motor.....F. J. Crouch et al
Motor-control system.....L. Janisch et al
Motor-starter.....A. J. Burns
Motors and signal for the same, Electric stop-motion for.....A. Cochrane
Music-leaf turner.....A. P. Hildebrandt
Music sheet, Combination vocal and instrumental.....F. B. Beinkamp et al
Music-winding roll for perforated music-sheets.....G. E. Mack
Musical instrument, Mechanical.....A. E. Whitehead
Musical instrument, Self-playing.....W. J. Publow
Nails, Manufacturing instruments for separating the cuticle from the.....A. Amory
Needle, Sewing-.....M. J. C. Nyborg
Nipper-tube.....W. A. Berry
Nut-lock.....H. Oldendorph
Oil-burner.....J. C. Fitzsimmons
Oil-can.....L. M. Foreman
Oiler.....J. E. Thron
Oiling attachment.....L. L. Logan
Order-holder.....W. R. Wilson
Organ-action, Electric.....W. R. Whitehorne
Overshoe-clasp.....R. L. Milliken
Overshoe-fastener.....J. T. Hearn
Ozonizer.....J. Steynis et al
Paint, varnish, and the like, Composition of matter for the removal of.....G. H. Hull
Panel-box.....F. S. Wahl
Paper, &c., from two single paper webs, Manufacture of card-.....R. Kron
Passenger-recorder.....C. Metzler
Pattern-grading machine.....A. F. Preston
Pedal mechanism, 2 pats.....G. B. Kelly
Pencil, penholder, &c.....T. F. Handly
Pencil-sharpening machine.....C. Nickum
Phonograph.....E. F. Leeds et al
Photographers' use, Means for producing artificial light for.....F. E. Barentzen
Photographic prints, Making.....C. L. A. Grasseur
Piano touch-regulator.....C. E. Pryor
Pin and clevis device.....A. O. Bucklus
Pipe-joint, Flexible.....W. A. Greenlaw
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Piston-rod lubricator.....E. Blake
Plant-shield.....J. Martin
Planters and elamping means therefor, Gage for seed-.....D. J. Mahoney
Plate-holder.....L. M. Shoemaker
Plow.....O. Beasley
Plumb and level.....F. O. Rourke
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Pneumatic control system.....P. Pforr
Pole-shoe.....W. R. Everett et al
Pop-corn balls, Machine for making.....W. W. Trunbull
Power-transmitting mechanism, Flexible.....R. I. Fancher
Pressure mechanism, Fluid-feeding.....G. Thompson
Pressure-recorder.....G. Spencer
Printing machine, Blue-.....J. C. Perham
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Propeller-adjusting device.....W. E. Blair
Pulley, Clutch-.....W. Baumgardner
Pulverizer, Soil-.....J. M. Sivadie
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Pump, Centrifugal.....J. G. Pfadt
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Pump, Rotary.....L. L. Pratt
Pumping machine, Breast-.....T. W. Howell
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Rail-joint chair and fastening.....M. Lachanee
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Rail-splice.....G. W. Blanchard
Rail-stay.....J. M. Scott
Railing.....W. Bayley
Railway cross-tie.....E. G. Gay
Railway cross-tie.....W. Clement
Railway-switch.....M. H. and W. Owen
Railway-tie, Metallic.....G. T. Bridwell
Railway track-motor.....F. J. Ritter
Rake.....C. Walther
Ratchet-tool.....E. R. Packer
Rectifier system.....O. O. Kruh
Reflector.....G. H. Herrnecker
Refrigerator-car.....J. D. Stewart
Registering device.....F. De Paris
Relay, Inverse time-limit.....P. Bendmann
Revolvers and other pistols, Barrel-grip for....G. C. Bourne
Rheostat, Starting and speed-regulating.....F. J. Seabolt
Rim, Detachable.....R. Kronenberg
Ring cutter.....J. H. Turcotte
Rock-drill.....R. H. Anderson
Rotary engine.....L. Bonner
Rubber hose, Vulcanizing-mandrel for.....S. J. Sill
Rubber tread.....W. E. Herbst
Salt and peper shaker, Combined..C. R. Byam
Sash-fastener.....D. W. Collison et al
Sash-fastener.....R. Daubaignan
Sash-lock.....E. Wimer
Sash, Metal window-.....E. A. Sanders
Sash-pivot.....F. Bogenberger
Saw-clamp.....W. F. Schmidt
Sawing apparatus.....C. H. Prescott
Scalding apparatus.....M. Lynch
Screw-cap.....R. M. Hollingshead
Scythes, Manufacture of.....A. Meis
Sea-groin.....J. A. Howland et al
Seal, Car-.....R. C. Pleins
Seal-lock.....J. M. Eedson
Seal-lock.....S. Schmidl
Seal, Mechanical.....F. P. Pfleghar
Seat.....A. Freschl
Selling machine, Newspaper-.....A. G. Jackson
Settee, Hall, convention, and eamp-meeting....J. W. Huebner
Sewing-machine, Overseaming...R. L. Plumley
Sewing machinery.....C. J. Palsson
Shade-roller bracket, Adjustable.....E. E. Quaintance
Shaft, Flexible.....G. H. Coates
Shaft, Swivel-jointed.....J. K. Stewart
Sharpening drills or drill-bits, Apparatus for...W. E. Kimber
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Sheet-combining machine.....I. W. Marshall
Shipping-case-cover fastener.....J. Brauer
Shipping-package.....W. N. Craw
Shoe-channeling machine.....E. A. Webster
Signal system, Electric.....A. A. Barbera
Signaling-circuit.....H. O. Rugh
Signaling receiver, Wireless-.....V. Poulsen
Signaling system, Electric.....H. C. Reagan
Siphon, Automatic flush-tank.....G. Land
Sketching outfit.....G. S. Smith
Slicing or cutting machine, Vegetable.....H. E. Madden
Smut-machine attachment.....E. Rinderman
Snow-melting apparatus.....S. Denemark
Soap-holder.....A. T. Waters
Sole-channeling machine.....E. A. Webster
Sole-edge trimmer.....J. Nickerson
Spark-plug guard.....R. S. Kearney
Speed indicating or recording apparatus.....L. E. Cowey
Spinning machine, Ring-.....G. H. Brabrook
Spinning-ring.....M. H. Maloney
Spring suspension.....W. O. Worth
Stacking-elevator, Portable.....E. Hanak
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Stopper.....E. W. Kottusch
Storage-bin.....G. W. Boll
Stove, Gas heating-.....H. Gerdes
Stove implement.....M. Davis
Stove-polish.....D. H. Tetrault
Stovepipe and flue-stopper fastener.....L. F. Culver
Street-cleaner.....R. L. Worthington
Street-sweeper.....W. S. Beeman
Stringer and tie.....J. W. Cooper
Strip-serving device, 2 pats.....F. S. Anable
Stud or rivet.....E. B. Stimpson
Submerged objects, Apparatus for recovering..F. H. C. Heyn
Substation-protector.....F. B. Cook
Switch.....L. B. Stevens
Switches, signals, &c., Power-applying apparatus for operating.....W. J. Bell
Synchronous motor.....E. F. W. Alexanderson
Table.....J. Brenner
Talking-machine sound-box.....W. J. Patterson
Tamping-machine.....P. Olson
Tea product and making same.....J. F. Meyer, Jr., et al
Telegraph-poles, Anchorage for.....J. D. Self
Telegraphic selective system....A. M. Roberts
Telegraphic transmitter.....G. A. Cardwell
Telegraphone system, Multiple.....G. Morin
Telegraphy, Wireless.....R. A. Fessenden
Telephone-exchange signaling device.....T. W. Gardner
Telephone instrument.....W. R. Daniels
Telephone-switch.....C. Truitt
Telephone system.....W. W. Dean
Thread holder and waxer....M. F. Dougherty
Ticket.....A. J. Reynolds
Timer.....C. N. Isaacs
Tire inflater, Automatic pneumatic-.....R. C. Barrie
Tire tool.....G. Mohme et al
Tire, Vehicle-.....J. L. G. Dykes
Tires, Detachable rim for vehicle-wheel.....E. A. Baker
Toaster.....C. Andrews, Jr.
Tongue, Buggy-.....T. R. Broyles
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Tool-holder, Turret.....F. E. Bocorselski
Tooth mount, Artificial-.....S. S. Bloom
Toy.....M. D. Cook
Toy.....A. Ensor
Toy.....T. A. Martin
Toy-railway switch.....C. A. Hotchkiss
Track-hanger.....A. H. Neller
Track-light and automatic signal, Continuous..J. M. Pitney, Jr.
Train-stop, Centrifugally-actuated.....J. B. Struble
Tramway-switch.....F. J. Kendrick
Tramway-switch, Automatic....E. L. Anderson
Transmitter.....J. T. Curtis
Transparencies, Holder for viewing..B. J. Falk
Trap.....W. Z. Pierce
Trolley-catcher.....M. G. DeLaney
Trolley-finder.....J. P. Reed
Trolley-wheel.....E. P. Sharp
Truck.....H. J. vom Scheidt
Truck, Car-.....R. E. Frame
Trunk-lock.....R. W. King
Turbine.....A. C. Wood
Turbine, Elastic-fluid.....W. Kieser
Turbine, Gaseous-fluid.....C. Wedekind
Twine-cutter.....J. De Young
Tying appliance.....J. Smith
Type casting and composing machine.....R. C. Elliott
Type-writing machine.....B. A. Brooks
Type-writing machine.....A. F. Decker
Type-writing machine.....C. H. Shepard
Type-writing machine.....W. F. Helmond
Type-writing machine.....G. F. Stillman
Type-writing machine.....E. B. Hess
Valve, Automatic.....A. J. Greenaway
Valve, Automatic.....M. L. Grove
Valve, Feed and quick-release.....J. A. Hicks
Valve, Filter-.....J. R. and C. P. Elfreth
Valve-gear.....A. J. Pocock
Valve mechanism, Engine.....A. Good
Valve mechanism for fluid-motors.....A. Beeht
Vehicle running-gear.....W. H. Chapin
Vehicle support, Monotrack-.....R. Scherl
Vehicles, Apparatus for discharging packages from moving.....J. Rowbotham
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Vessel, Motor.....D. C. Blake
Wall, Building-.....J. S. Culley
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Washing-machines, Water-motor for.....J. Wagner et al
Waste waters containing cyanids and sulfocyanids from poison, Frecing.....P. Goldberg
Water-motor.....F. Breitenstein
Water-supply tank, Automatic..C. E. Bathrick
Water-tube boiler.....L. L. Summers
Waxes, paraffins, solders, &c., Heater for applying and melting.....F. A. Reilley
Waxing device, Laundry-iron.....C. B. and A. L. Weatherhead
Weighing-machine, Automatic.....C. D. Scott
Welt-beating machine.....W. B. Keighley
Wheels on axles, Means for securing.....D. Ballif
Whiffletree.....A. O. Heimsness
Windmill-frame.....L. W. Noyes
Window.....B. A. Warliek
Window.....S. U. Barr
Window-cleaner.....G. C. Dwight
Window-fastener.....A. G. Howland
Window-front construction.....F. M. Jackson
Work, Device for the support of.....F. Wolfensberger
Wrench.....F. D. Bodey
Wrench.....V. Carlson
Wrench.....J. Minett
Wrench.....H. R. and R. J. Munce

DESIGNS.

Ash-receiver and stand.....O. Nelson
Automobile-horn.....L. Rubes
Bottle.....D. W. Bagby
Bottle.....P. O. E. Friedrich
Bottle.....J. J. Greene
Bottle.....P. W. Schofield
Bottle.....G. B. Van Wye
Bottle-casing.....G. P. Altenberg
Brushes, mirrors, or similar articles, Back for..H. J. Herbert
Carpet.....F. A. Haas
Curtain, Lace.....W. Hardy
Curtain, Open-work.....W. M. Maser
Display-stand.....H. W. Fishel
Lamp.....P. Krastin
Lunch-board, Lap.....L. Van Putten
Motorcycle-horn.....L. Rubes
Note-sheet, Shorthand.....W. J. Guy
Ruching.....A. Boehm
Sideboard.....O. Hebestreit
Spoon, Bonbon-.....W. W. Brown
Spoon, fork, or similar article.....J. Clulee
Spoons, forks, or similar articles, Handle for.....W. C. Codman
Spoons, forks, or similar articles, Handle for.....G. P. Ittig
Spoons or similar artieles, Handle for.....J. E. Straker, Jr.
Type, Font of.....S. C. Gaunt
Vehicle-body.....R. Huff
Vending-machine casing.....A. Stewart
Water-heater.....W. J. Finn

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Aeid, Concentrating nitrosulfuric waste.....H. Pauling
Acid, Making nitric.....O. H. U. Brünler
Acid, Making tartaric.....J. McDougall
Adding-machine.....A. E. Cole

Adding-machine.....J. G. Vincent
Adding-machine.....R. C. Streb
Adding-machine.....A. Hoch
Addressing-machine, 2 pats.....E. H. Frey
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Adjustable stand.....G. O. Miller
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Air-compressor.....F. W. Parsons
Alloys, Electrodeposition of.....
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Alloys, Producing ferro.....F. M. Becket
Amalgamator.....B. F. Geiger
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Animal-trap.....D. D. Dennis
Annealing-box.....W. B. Bennett
Antisnoring device.....L. F. Liebhardt
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Audiphone.....C. L. Buckwalter
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Bearing for wheels, Centrifugal-oiling.....
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Binder for loose sheets, Temporary.....
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Bit.....F. Swales
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Boat-lashing device.....F. T. Clayton
Boiler-tube expender, 2 pats....J. W. Faessler
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Boot and shoe cushion.....F. P. McIntyre
Boring-machine.....F. J. Waters
Bottle-capping machines, Cap-feeding mechanism for.....A. Jones
Bottle-closer.....T. S. Rainey
Bottle-locking device, Milk-.....F. Johnson
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Butter granulator and purifier.....F. Seim
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Car-coupling.....A. P. Goldman et al
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Car fender, Street-.....E. H. Schulze
Car-replacer.....W. M. Kitchen
Car safety appliance, Railway-....J. T. Andrew
Car standard, Log-.....M. Majette
Car, Tank-.....J. F. Streib
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Car-windows, Dust and cinder shield and guard for.....J. S. McKenzie
Cars, Automatic pipe-coupling for railway-.....
.....E. E. Gold
Carbureter.....F. H. Heitger
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Carton.....F. F. Gokey et al
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Channel-flap-turning machine....C. P. Stanbon
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Checkrein-releasing device.....S. P. Foster
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Collapsible tube and the like.....M. Faust
Collar and garment fastener.....W. M. Lowrie
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Conveyer.....W. M. Heiney
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Corn-husking machine.....W. N. Springer
Cotter-pin.....D. W. Smith
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.....J. R. Fordyce
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Cracker-box.....G. C. Macdonald
Cranes, Guiding means for load-supporting ropes in.....A. W. Elsing
Crate, Egg-.....D. M. Rowe
Crushing-rolls, Leveling device for.....
.....W. H. L. Fielding
Culinary vessel.....J. Stuber
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Culvert.....D. C. Boyd
Current-motor.....H. C. Coder
Currycomb.....T. E. Desmond
Curtain-fixture.....H. M. Stevenson
Curtain-pole.....H. D. Mayhorn
Cutter-holder.....A. L. Valentine
Cutting-machines, Cutting and edge-compacting member for.....A. F. Preston
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Derrick.....P. Yorke
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Door-closer and fly-chaser, Combined.....
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Door-lock.....G. E. Spiltoir
Door safety device.....J. Grüninger
Doors, Hanging mechanism for laterally-movable.....J. L. Kail
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.....J. L. Woodbridge
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.....J. D. Macpherson
Engines, Heat-dissipating device for gas-.....
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Envelop.....T. S. Corbitt
Evaporator.....E. von Seemen
Excavator, Clay-.....R. N. Williams, Jr.
Explosion-engine.....T. W. Heermans
Explosive-engine.....V. F. Carpenter
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Fluid-pressure brake.....C. A. Tripp
Fluting or beading machine....C. R. Voorhies
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Fly-escape screen, Out-trapping.....
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Gin cleaning mechanism, Saw-...J. G. Dickson
Glass brick, tile, and building-block.....
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Gopher-trap.....A. F. Renken
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Hair crimper and curler.....P. E. Oswald
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Harrow.....E. S. Kinkade
Harvester bunching device.....W. H. Wilder
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Heat-retainer and drip-pan.....E. C. Reiter
Heel-cushion.....M. Byrne
Heel-plate.....J. Liden
Heel-protector.....I. Lincoln
Height-increaser, heel-cushion, and stocking-protector, Combination.....L. W. Litch
Hinge.....R. P. Hawley
Hinge, Double-acting spring-.....E. Bommer
Hinge for day-gates, Gravitating..F. W. Rodier
Hog-hoisting apparatus.....T. D. Foster
Hook and eye.....J. F. Schoeppl
Horseshoe-calk, Removable...I. S. Brassington
Horse checking and unchecking apparatus.....
.....H. A. Clemens
Hose and pipe coupling.....W. Eisemann
Hose-coupling.....W. B. Steen
Hydraulic motor.....W. R. Clarkson
Hydraulic press.....T. E. Holmes
Ice-cream freezer.....J. H. Hart
Ice-cutting tool.....J. G. Bodenstein
Ice plants, Electric recorder for.....
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Incubator.....G. Kutz
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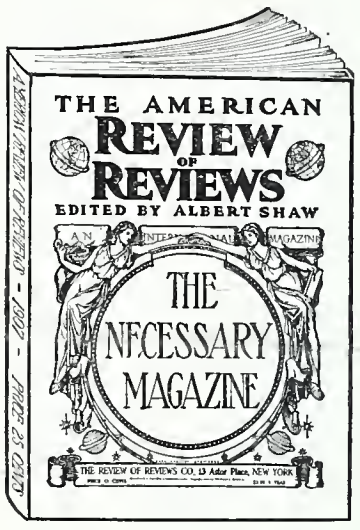
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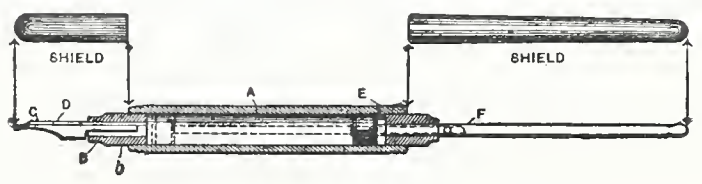
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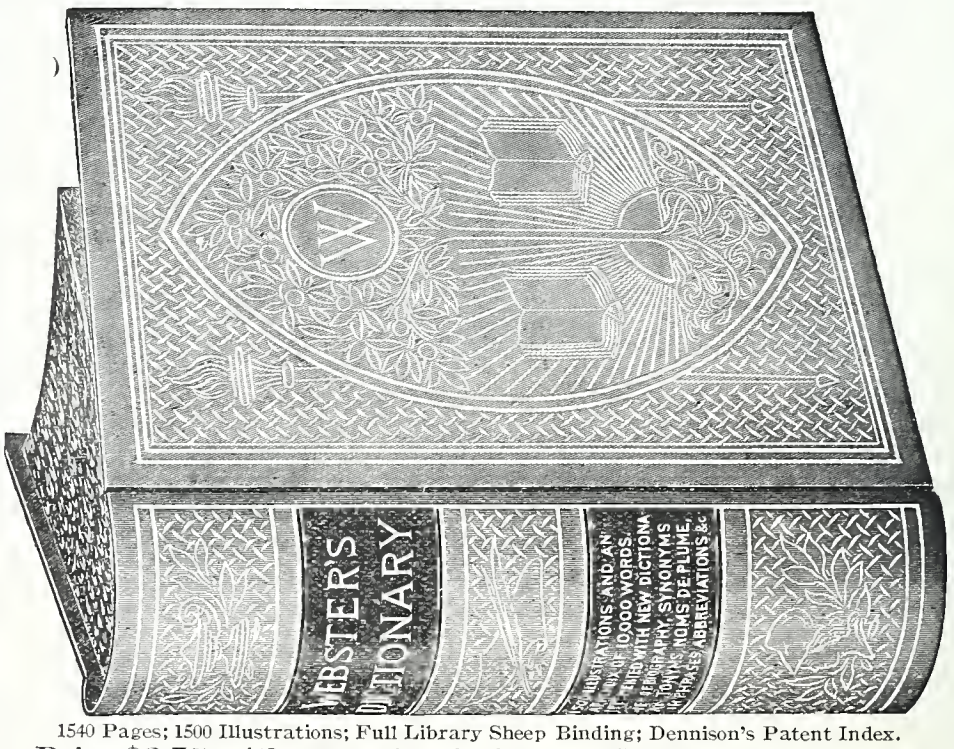


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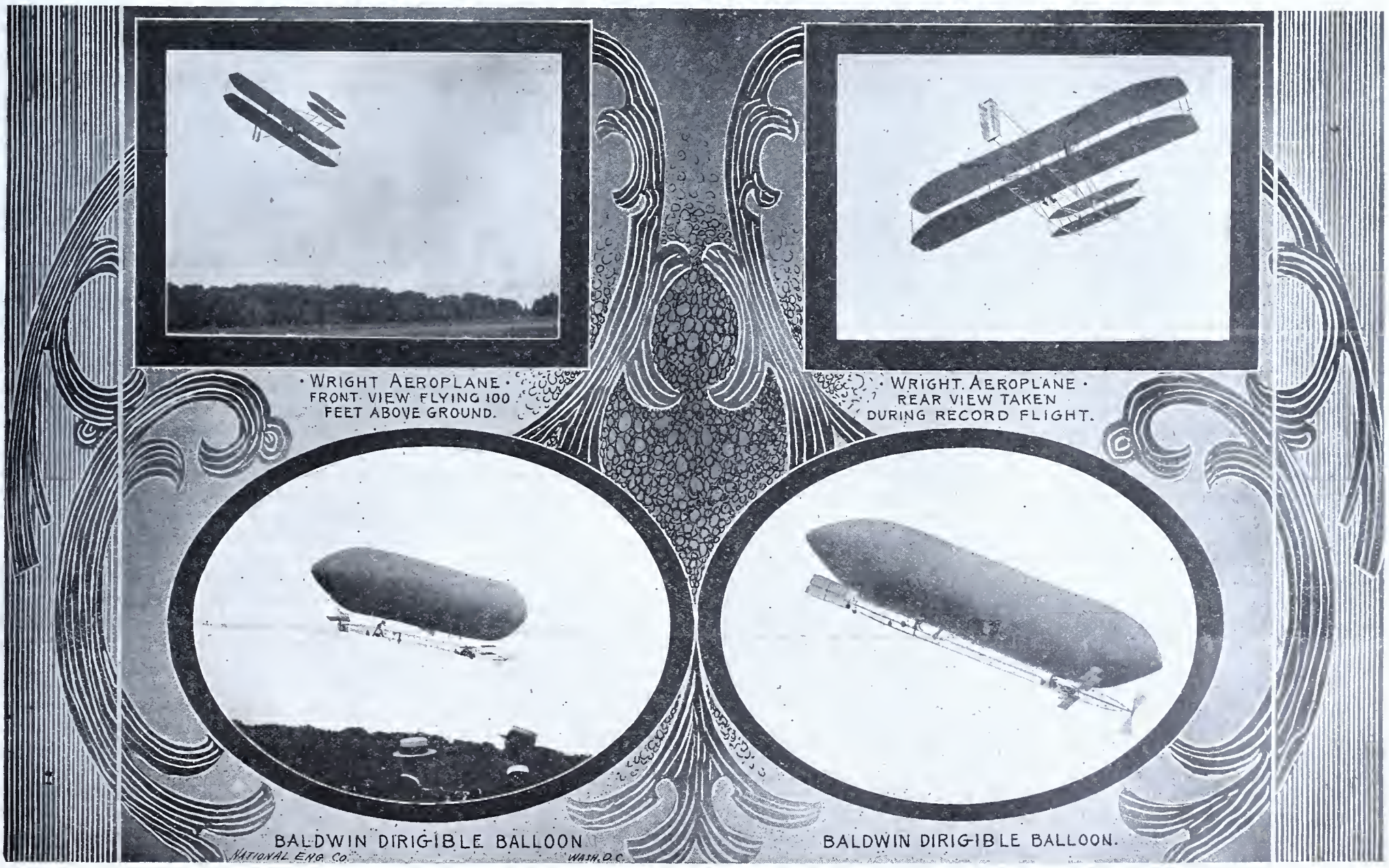
A Journal of Manufacturing Industry and Scientific Progress.

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PRACTICAL AIRSHIPS.

THE UNITED STATES has determined to follow the example of European nations, and invest in airships. If the day—often predicted—ever comes when the world will see "airy navies grappling in the central blue," Uncle Sam wants to have his own fleet in readiness. The advertisements issued by the government during the past few months show that it is in earnest in this matter. The army authorities have, in fact, been considering the subject seriously for years. A decade ago they appropriated $50,000 to develop the Langley flying machine; and in spite of the apparent failure of that pioneer among man-built birds, they were not discouraged. The last Congress was asked $200,000 to be used in the purchase of airships and for experiments therewith; and the Board of Ordnance and Fortifications allotted $25,000 for this purpose. Official tests have been held at Fort Meyer, an army post near Washington, of various forms of aerial craft. Baldwin, a veteran in the sphere of things aeronautic, submitted a dirigible balloon that satisfied the war officials; and now an aeroplane is to be bought from the most successful of experiments in this special line, the Wright brothers.

The work of the Wrights has been conducted in so much privacy that the curiosity, and it must be admitted the skepticism, of the public had been aroused. But although the official requirements were severe (in fact, a French authority declared that it would be five years before they could be complied with) the recent tests have resulted in a triumph for the Wright machine. It is no exaggeration to say that the result has marked an era in the progress of the civilized world. In spite of an unfortunate accident that for a time arrested the trials, it has been demonstrated satisfactorily that flying machines, heavier than air, can really be made to fly. The interested crowd who watched the airship rise smoothly, circle round the field, ascend to any height desired, move slowly or rapidly at the will of the operator, execute evolutions, and finally alight on the earth as easily as a great bird, realized that



history was being made. Two men were carried at times, a speed of 50 miles an hour was reached, and there was no apparent reason why the flight should not have been continued indefinitely. Aerial navigation without the use of gas is no longer a will-o'-the-wisp, but an accomplished fact. The aeroplane has proved its ability not only to fly regardless of air currents, but to remain aloft as long as the gasoline lasts.

The machine that accomplished these feats is shown in the accompanying drawings, in the act of breaking the record both in the rate of speed attained and the length of time it remained in the air. As may be seen, the construction is simple, consisting roughly of two planes between which are placed the engine, the steering apparatus, and the seat for the operator. Two smaller planes, extended in front, are designed to flap up or down, so as to cause the machine to rise or descend. The rudder is behind and is used for turning to the right or left; in this work it is aided by the back part of the upper large plane, which also may be raised or lowered in the same manner as a bird raises or lowers its tail feathers, which assists in making turns. Motion is given by means of two two-blade propellers, which describe a circle about six feet in diameter. The vessel, before starting, is mounted upon a car which runs along a track far enough to give it momentum, and then rises in the air. The runners beneath it are of service not only in starting, but also in alighting, as they cause it to slip along the ground and at the same time take up much of the shock caused by contact with the earth.

Since the days of Daedalus man has been trying to fly, and though balloons are centuries old, the progress of machines which follow the principle of the bird in flight has been very slow. The public has shown great incredulity as to the practical working of such devices, and up to a few years ago, any suggestion of aerostation was received with ridicule. The efforts of Professor Langley met with scorn, and the army was sharply criticized for wasting money on a chimera. That learned physicist, who knew more about aerodynamics than any man of his time, died before his aerodrome built by the army was ever launched. Although he had succeeded in making several large models propelled by steam fly across the Potomac, and was the first man in the world to perfect a motor craft which could fly while supported only by the dynamic reaction of the atmosphere, the failure of the last trials covered his name with contumely. Pioneers in a cause are usually martyrs; the Brazilian monk who, in the eighteenth century, succeeded in making short flights in the air was promptly put to death; and in like manner Langley's memory was pilloried for his association with "that fool idea." Yet the Wright device is a development along the same lines, the chief difference lying in the fact that the Ohio inventors have gotten away from the bird wing plan, which idea has undoubtedly hampered the progress of the practical flying machine for years. In general outline the Wright machine more nearly resembles the double-planned apparatus of Chanute, the vital distinction being that the Wrights have made the device practical and successful.

The army officials advertised for an aeroplane that would carry two persons, or a total weight of 350 pounds. Besides this it should carry sufficient fuel for a flight of 125 miles. It should be so designed that its parts could be quickly and easily assembled and taken apart and packed for transportation in army wagons. It should be capable of being assembled and put in operating condition in an hour, and should have a speed of at least 40 miles an hour. It is understood that the Wright machine complies with all the conditions required.

The Signal Corps also advertised for a dirigible balloon, able to carry two persons and 100 pounds of ballast. The desired speed was fixed at half that of the aeroplane, or 20 miles an hour. The dimensions and shape of the balloon were left to the inventor, but it was not wished to have one over 120 feet long. Inside the main gas bag were to be one or two ballonets, having a total capacity of one-sixth that of the gas bag. Ballonets are little balloon-like bags inflated inside balloons in order to keep their envelopes at a uniform stiffness. Those inside the army dirigible balloon were to be connected by tubes to a blower which would maintain within them a constant air pressure. The suspension frame supporting the car and motor were to be made so that it could be quickly assembled or taken apart.

The Baldwin balloon satisfied these requirements. As shown in the illustration, it is soaring at an altitude of 200 feet. It is ninety feet long, eighteen feet in diameter, and weighs about 1050 pounds. A network of small cords thrown over the gigantic bag suspends a frame work sixty-one feet long. Directly in front of the framework is a huge propeller, weighing twenty pounds and measuring 11 feet from tip to tip. Twenty feet from the front, on a small platform is a 30 horse power engine, capable of spinning the heavy propeller at the rate of 1800 times a minute. On a platform directly behind the engine sits the operator. In the figure Captain Baldwin is shown midway of the airship, steering the balloon. At the rear of the framework is a large canvas rudder, with horizontal and perpendicular planes. This yields most readily to the slight pull on the ropes running to "midships". The army officials were entirely satisfied with the performances of both machines. They are ready to investigate other forms of airships, however, and the heliscopter of Berliner and the Bell tetrahedral aeroplane will come in for a share of their attention. There would be a great field for flying machines in scouting and dispatch carrying in times of war, as well possibly as in dropping explosives and in other offensive operations.

In connection with the experiments with balloons, it is interesting to remark that the recent perfection of a method of preparing hydrogen gas may do much toward promoting this line of aeronautics. Cheap hydrogen is of great importance at the present stage in the development of ballooning, where, in many cases—for example, polar exploration—it is essential to have a much lighter gas than illuminating gas. The new process has so effectively lowered the cost of hydrogen, that it has accomplished for this gas what a scientist a few years ago did for oxygen, when he introduced the method of the fractional distillation of liquid air, thus securing an "air" consisting of oxygen with but a slight admixture of nitrogen.

Heretofore, aeronauts have been forced, in order to obtain gas for balloons, to use the expensive process of preparation based upon the action of acids (hydrochloric or sulphuric) upon metals—usually upon iron. The transportation of acids to remote points is also attended with much inconvenience and difficulty. All these drawbacks are obviated by the new method, which employs only coke, calcium carbide, and water. The first step is to produce "water gas"—the well known gaseous mixture obtained when a current of steam is passed through a layer of red-hot carbon. This gas has for years been employed as a fuel and also for illuminating purposes, either when saturated with volatile hydrocarbons or in connection with incandescent mantles. Its own flame, when burning in the air, is almost destitute of luminous properties. Water gas consists of a mixture of hydrogen and carbon monoxide gases, with small amounts of nitrogen, etc. Theoretically the two gases should be present in equal volumes, but in practice the amount of free hydrogen is far behind the theory. Now comes a German professor and eliminates the carbon monoxide, by a very simple method. The gaseous mixture is conducted over glowing calcium carbide in the form of powder. As a result, the carbon monoxide is completely decomposed in contact with the calcium carbide. Lime is formed, and carbon in the form of crystalline graphite is separated. The minor impurities of the original mixtures are likewise removed, and hydrogen containing but one percent of other gases is isolated.

It will be seen that the process is extremely simple and cheap, and permits the easy and rapid production of large quantities of hydrogen, practically pure in quality. An installation capable of evolving daily a volume of 70,000 cubic feet of hydrogen occupies a very small space. This method will make hydrogen available for other technical purposes—autogenetic welding, and the like.

To keep themselves posted in the progress of the arts in which they are interested, inventors and manufacturers should subscribe for the INVENTIVE AGE, which publishes a list of all patents issued each month. The low subscription price and the character of the publication, entitle it to the support of all the inventors of the country.

AN INCLINED ELEVATOR.

By FRANK C. PERKINS.

A novel electric elevator of the inclined type is in operation at St. Moritz, in the Engadine, the car being similar to that of any elevator for office building or hotel, the rails being inclined, and the car swinging on an axis supported by trolleys running on the elevated rails, so mounted as to always hang vertically. The accompanying illustration shows this inclined elevator, which somewhat resembles an inclined cable railway. Steel towers are used for supporting the curved rails, which are mounted on a light steel lattice work, the total height being about 92 feet and the total length of travel about 132 feet as measured on the curved track. Six passengers may be carried at a time, the working load of the car being 1000 lbs., and the speed about 150 feet per minute as a maximum. Double helical gears are used of special



design, and the geared drum which works the elevator is said to have a high efficiency, the amount of current consumed being relatively low. A three-phase alternating current motor is employed, which takes a current of 240 volts pressure at a frequency of 50 periods per second. The motor and drum shafts are in line and a double reduction gear is employed, the cast steel double helical gear wheels having machine teeth and running in oil in a cast iron gear case. In order to minimise the wear, care was taken that the groove in the drum should accurately fit the rope, the diameter being exactly the same. The cable is of a very high quality of steel.

A flange coupling is used for connecting the three-phase motor to the shaft carrying the first pinion of the reduction gear, and this flange coupling also acts as a brake drum. The motor is of 9 horse-power capacity, and a motor type of brake is employed which acts through a system of levels. This brake is released only when the current flows normally through the motor. The elevator is said to be practically proof against any accident which will endanger the lives or limbs of the passengers. A safety catch is provided on the trolley which carries the car, and in case one

of the winding ropes should slacken or break, the guides attached to the track are strongly gripped, locking the car securely by the release of two eccentric checks or cams.

Tbe automatic control system used is of special interest, as there is a form of push button by means of which it is possible for the car to be employed without an attendant by any passenger. It is impossible for the lift to be started before the doors are properly closed, as tbe electric control contacts are interlocked. The doors of the landings can only be opened when the car is opposite tbem, on account of mechanical interlocking devices provided for this purpose. It is also stated that the action of control is such that the car stops gradually and automatically at the end of its trip.

Tbe car is started by pressing one of tbe buttons, and it moves continuously until it reaches the floor corresponding to the button which was pressed. The contact drum makes less than one revolution for the whole journey of the car, as it is driven positively by the winding drum, and thus its position corresponds at all times to that of the car. Current flows to tbe motor in one direction or the other according as tbe car is above or below tbe floor desired. The hotel where this device is installed is on a hillside overhanging the lake, and tbe elevator carries guests from the water level to the main floor of the hotel.

DAN BEARD'S

"Guns and Gunning."

A book that every "outdoor" man and boy will enthusiastically welcome has just been publisbed by the makers of the famous Stevens Firearms. This volume consists of 112 profusely illustrated pages and is devoted to woodcraft, the haunts and habits of furred and featbered game, camping, hints on equipment, cooking, etc. "There's ozone from the woods on every page." The facts contained in "Guns and Gunning," for that is the name of this most interesting book on the "Great Out-of-Doors" and its attendant pleasures, bear the positive stamp of authenticity and authoritativeness. Dan Beard, the eminent sportsman, writer and artist, is the Editor of "Guns and Gunning." What this autbor does not know about woodcraft and wood lore is not worth knowing. Every boy contemplating a vacation trip, every man betaking bimself to the woods and fields to recuperate from wear and tear of business life, will want a copy of "Guns and Gunning" to guide him right in communing with Nature. Remember that a Stevens Rifle and the book mentioned are indispensable requisites for your vacation days.

Stevens Arms are for sale by all progressive Hardware and Sporting Goods Merchants and Dan Beard's splendid effort–"Guns and Gunning"—will be mailed postpaid to any applicant by J. Stevens, Arms & Tool Company, Chicopee Falls, Mass., upon receipt of price. For paper covered edition forward 20 cents; for cloth bound book send 30 cents.

AUTOMOBILE SLED ATTACHMENT.

A novel device for converting automobiles into motor-driven sleds for winter use has been invented by H. H. Rohlf, of New London, Wisc. Tbe cut shows the attacbment as used in a crude form on an automobile in winter. It will be seen that tbe usual wheels are removed and replaced by runners and drivers. The invention consists of movable runners and drivers and interposing jacks, operated by a fluid, medium or hydraulic pressure, under control of the operator. This permits the drivers to be thrown into, or out, of an operative position, or to any intermediate position according to the nature of tbe surface over wbicb the sled may be traveling. The invention also embodies equalizing means between tbe movable drivers and runners to insure uniform and synchronous movement, wbich is essential to the ease and comfort of the rider, and to an equal application of the propulsive force. To obviate strain upon the driving mecbanism and a jerky motion, there are interposed a plurality of coiled springs between the bydraulic jacks and the upper framework of the runners by which the load is supported. This in a measure also insures automatic adjustment of the drive wheels to surface irregularities.

The invention further provides an indicator showing the relative positions of the runners and drivers, so that the projection of the drive cogs below the runners may be ascertained at a glance, by referring to a dial and finger, which is actuated by the vertical movement of the drivers when thrown into or out of operative position.

It has been proven that bare spots in roads or bridges present no impediment. The usual brake facilities are applied, thereby insuring complete control of the machine at all times.

By the use of this attachment old men can go coasting again with tbe boys. It is adapted to drive up hill and, by raising the driving mechanism, to coast down. Witb a few variations in attacbable parts, this invention is adapted for use on all makes of automobiles, and can be applied at a cost of from one to three hundred dollars.



Mr. Rohlf, writing to the INVENTIVE AGE, says that this automobile sled attacbment, if used in not over two feet of snow, will travel as well if not better than the paddle wbeel-propelled sled described in the September issue of this paper.

On ice or packed snow it will mount any grade that can be covered by an automobile on wheels. A motor vebicle with this attachment travels much faster than on wheels. There is absolutely no chance for skidding. The steering is done with the front runners, by the same means used on automobiles.

Tbe appliance of this attachment in no way disfigures a car, or interferes with its equipment. The only change is the removal of the front wheels, together with the axle stubs.

THE INVENTIVE AGE contains sound advice to inventors and patentees. For lack of such advice many have lost money. Subscription price, one dollar a year.

New Mercury Lamps.

Another mercury vapor lamp which has been lately introduced replaces by means of quartz the glass tube of the Cooper-Hewitt lamp. In the ordinary mercury vapor lamp, the power consumption reaches a minimum at about 0.6 watt per candle; if more power is supplied, the candle power increases at a slower rate, and the efficiency therefore decreases. By employing quartz, with its high melting point, instead of glass, the lamp tube can be run up to a much higher temperature; and it was found that after a maximum consumption, the efficiency once more improves, and still better efficiencies can be reached without difficulty. Another advantage of this material is the reductions whicb are rendered possible in the dimensions of the lamp. While mercury lamps for 110 volts require glass tubes 44 inches long and one and a half inches in diameter, the lighting tube of a similar quartz lamp need not be more than three and a fraction inches long, and about a half inch in diameter. It is therefore possible to employ fittings resembling those of arc lamps. On switching on the quartz lamp, the light fills the whole tube as in the known patterns of mercury vapor lamps; but after a time the glowing discharge become a mere thread, and the color changes from the objectionable glaring green to a yellower or whiter light.

Long luminous tubes are another new form of lighting. The lobby of the Madison Square Garden, in New York, and other establishments are fitted up with this apparatus, which gives a novel effect. A vacuum tube, upwards of 2 inches in diameter, is supported near the ceiling by brackets, and encircles the room. This continuous tube is made in place from 6 or 8 foot lengths, joined with blow-pipes. The ends of this long tube are brought to a steel box. Large carbon electrodes are inside each end of the tube, connected to the outside contacts by platinum sealed in the glass. The completed tube is exhausted in position by a vacuum pump. The necessary high tension current is obtained from a simple transformer, located in the steel box.

It was early shown that, with such tubes, the rarefaction steadily increased, adding to the resistance in an obscure manner until it became too high for the working voltage. Consequently the light of the tube soon went out. This difficulty is now overcome by an ingenious regulating valve. A piece of glass tubing is supported vertically, with its bottom contracted into another glass tube which extends to the main lighting tube. At the point of contraction a carbon plug is cemented in. Its porosity is such that gases easily percolate through, but not sufficient to permit the mercury which normally covers it to pass. Partly immersed in the mercury and concentric with the carbon plug is a smaller movable glass tube, whose upper part carries a bundle of soft iron wires, which form tbe core of a solenoid in series with the primary of the transformer. There is a critical point of vacuum at which the conductivity is a maximum, and the tube normally works a little below this. As the vaccum becomes higher, the conductivity increases and a greater current flows through the solenoid. This lifts the displacer, lowers the mercury level, and exposes the carbon tip. Immediately a minute amount of gas passes into the vacuum tube, until the vacuum falls to normal and equilibrium is established again. This action is repeated about once a minute during the use of the tube.

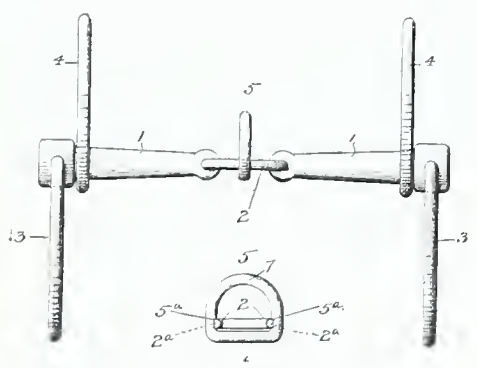
When the regulating valve is arranged to admit air, the light given by the tube is rose colored. If nitrogen is used the light is yellow, and when carbon dioxide is admitted a close imitation of daylight color values is obtained.

CLEVER NEW PATENTS.

Bridle Bit.—Liquid Soap Dispensing Appliance.—Incubator.—Hatchet.

Bridle Bit.

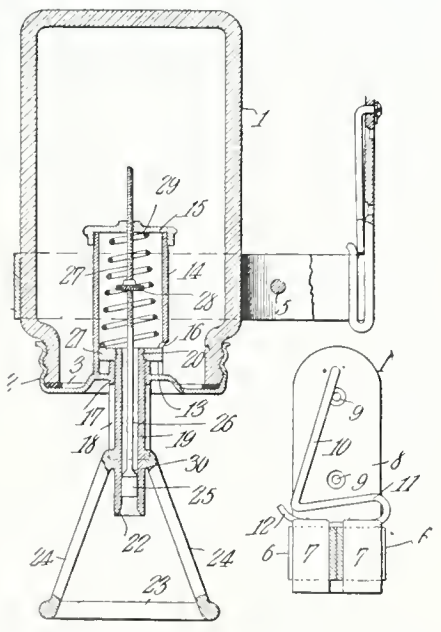
Melvin Jincks, of Cohocton, N. Y., is the patentee of an improved bridle bit that is especially constructed to subdue fractious animals. By referring to the accompanying illustra-



tion, it will be noted that the bit comprises two bars 1, which are connected by a link 2, and rings 3, arranged in the outer ends of the bars 1, and adapted to be engaged with the reins. Secured to the link 2 is a cross link 5. In operation when the bit breaks at link 2 by drawing on the rings 3, the link 5 engages the roof of the animal's mouth, and through a reciprocating motion, which is imparted to the bit by sawing on the reins, the mouth of the animal is thereby rubbed sufficiently to subdue him.

Liquid Soap Dispensing Appliance.

This is a novel device for dispensing liquid soap, and is designed to be used in public lavatories. It consists of an inverted glass jar which is mounted in position by means of a metallic band connected at its ends to a wall plate or bracket, the latter being secured in place by screws. A latch 10 is employed to hold the band from displacement with relation to the wall plate. The small sectional view shows the particular construction of the wall plate and latch.

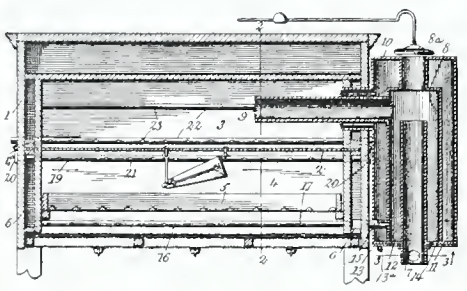


The lower open end of the glass jar is provided with a screw cap 2 which carries the mechanism for dispensing the soap. Said mechanism comprises a piston 21 mounted within a cylinder 14 and connected to the upper end of a tube 19, the lower end of which carries a ring 23, which is maintained in a horizontal plane by means of diverging arms 24. Within the tube 19 is mounted a rod 26 which has at its lower end a plug 25, and at its upper end a screw collar 28. The rod is screw threaded and passes through the top of the closure 15. A spring 29 is confined within the cylinder, and bears at one end against the closure 15 and at the other against the piston 21. When a person desires to procure a charge of soap, he places his hand against the underside of the ring 23, which is of a size so as to be easily contained on the palm of the hand, and pressure is then exerted to force the ring 23 upward. The spring 29 is compressed and the soap is caused to flow out through the lower end 22 of the tube 19. When the hand of the user is removed from the ring, the expansive force of the spring returns the parts to their normal positions. By means of the rod 26, the device may be adjusted to regulate the pressure established before the soap is allowed to escape, and also to regulate or limit the amount of soap expelled at each operation.

The patent on this novel and useful device was issued to Horace P. Gorman, of Hazleton, Pa.

Incubator.

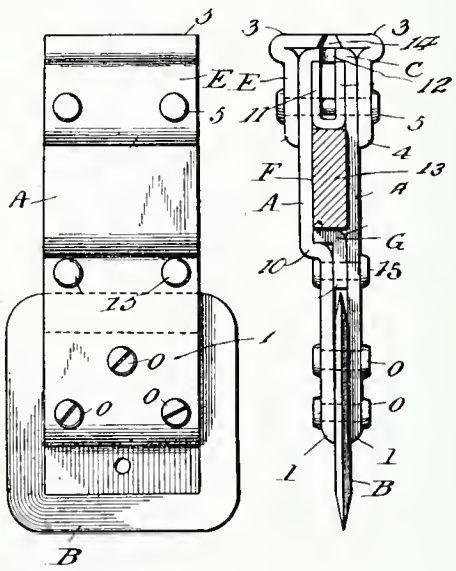
One of the most fruitful causes of failure in hatching chicks by artificial means is the lack of proper ventilation. Many a poultryman who has wondered over the small percentage of productive eggs in his incubator, would find on investigation that [illegible] due to the absence of the requisite supply of air. This difficulty is remedied by a device invented by George Howard Lee, of Omaha, Nebr., which provides improved means for



ventilating the egg chamber of an incubator, and further insures a perfect air-tight joint between the egg-chamber and the treating chamber. By reference to the illustration, it will be seen that the incubator body is of the usual box form, divided by a horizontal diaphragm 2 with a tray 5 below the same. Except at the front this diaphragm extends completely through the inner wall so that its edges rest against the outer wall, and is secured between cleats 4a in the double wall. These double walls provide an air space 6 filled with cotton. A lamp under the chimney 7 supplies heat to the heating chamber 3. The chimney is surrounded by a hood 8, from which a horizontal flue 9 projects into the heating chamber. A jacket 10 encases the hood, and the lower head 11 of the jacket has a number of draft openings 12. A short pipe 15 leads from the hood 8 to the air space 6. In the lower portion of the egg chamber is a horizontal ventilating outlet tube 16, terminating in the air space 6 and provided with a number of perforations 17, the object of this tube being to open communication between the egg chamber and the pipe 15. Above this pipe is a ventilating inlet tube 19, which extends through the outer walls of the incubator (the ends being normally closed by caps 20) and also has a series of perforations 21, through which air passes into the egg chamber. A number of outlet tubes 22 are provided in the heating chamber, which also extend through the walls of the apparatus. The ends of these tubes are open, and they have openings 23 throughout their length within the chamber. In operation, heated gases pass up the chimney 7 and through the flue 9 into the heating chamber, creating an upward draft in the hood, and a suction in the tube 15, so that the air is drawn from the air space 6, and also through the openings 17, from the egg chamber. The damper 13 regulates the draft. When the caps 20 are opened, fresh air passes through the tube 19 into the upper part of the egg chamber, thus cooling it, while the air at the bottom is constantly drawn off through the tube 16. In this way the temperature of the chamber is maintained even. The arrangement of the diaphragm is such that its edges passing through the inner wall render the joint at this point absolutely air-tight.

Hatchet.

A unique from of hatchet has been patented by Josiah R. McCoy, of Marshalltown, Iowa, the special feature being the combination with a hatchet of a detachable bit and also of a nail puller. The frame portion of this implement is formed from a single piece of sheet material, thereby enabling the same to be cheaply and economically manufactured. This material is doubled upon itself, as shown in the illustration, to form a loop F, the sides A-A of the loop being connected at one end by the poll C and provided at the other end with extensions 1-1, one of these extensions being provided at the base of the loop with an offset portion 10, whereby it is thrown inwardly toward the opposite extension. Fitting within one end of the loop and abutting against the poll is a filler 11, which is provided with a recess facing the poll and communicating with a notch 12 formed in one end thereof. In this instance the filler is of sheet material and of U-shape, its limbs abutting against the poll and the said filler bearing against the upper side of the helve 13, which is inserted within the loop. Applied to the poll is a remarkable cap 3, having flanges E secured to the frame of the hatchet by rivets 5, which also hold the filler 11 in position. This cap 3 may be enlarged laterally so as to project and provide an increased striking surface for driving nails, etc. One end of the cap 3 is notched at 14, the notch fitting over the notch 12 in the poll and co-operating therewith to form a nail puller. At the opposite end of the loop F is



an angle piece G, one arm of which fits over the offset 10 and engages the lower side of the helve 13, while the opposite arm is disposed between the extensions 1-1 and has a plurality of cutting edges, any one of which may be held in operative position. In the cut it is shown with four cutting edges and the central portion of the bit has four openings, any three of which may be engaged by the three screws O, passing through the extensions to hold the cutting edge in position. This bit may be made integral with the frame, if preferred.

With such a hatchet, it is obvious that the parts which are subjected to the most serious wear—the bit and the cap fitting over the poll—can be readily removed and replaced as desired, thereby greatly prolonging the life of the implement. It should be noted that the sheet metal blank, from which the hatchet shown in the drawings is formed, is rectangular in shape and formed with straight edges, thereby eliminating waste when the blanks are formed.

PATENTS

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

UNIVERSAL BRUSH CO. v. SONN et al.

(Circuit Court of Appeals, Second Circuit. June 29, 1907. 154 F. R. p. 665.)

1. PATENTS — INFRINGEMENT — METHOD OF MAKING BRUSHES.

The Morrison patent, No. 717,014, for a method of making brushes, which consists in depositing a mass of heated plastic composition, which becomes hard when cooled, within a chambered brush frame having a contracted aperture, and forcing one end of the groups of bristles into the composition when in the plastic state, is not a pioneer, but covers merely an improvement on known methods, and must be limited strictly to the particular advance made. It is not infringed by a construction in which the aperture of the chamber is not contracted, but the sides are perpendicular to the bottom, and in which the chamber has a raised portion in the center, which assists in holding the composition in place by adhesion and also lightens the brush.

2. SAME—CONSTRUCTION OF CLAIMS.

A patent cannot be given a construction broader than its terms, in order to cover something which might have been claimed, but was not.

JAMES E. TOMKINS CO. v. NEW YORK WOVEN WIRE MATTRESS CO.

(Circuit Court, S. D. New York. May 3, 1907. 154 F. R. p. 669.)

PATENTS—INFRINGEMENT—DESIGN FOR BEDSPRING.

The Tomkins design patent, No. 37,649, for a design for a bedspring, held to disclose patentable novelty and invention, and also to be infringed by a spring which, while not an exact copy of that of the patent, is sufficiently like it to deceive purchasers who give it ordinary observation.

GENERAL ELECTRIC CO. v. CORLISS et al.

(Circuit Court, N. D. New York. July 9, 1907. 154 F. R. p. 671.)

PATENTS-INFRINGEMENT-ELECTRIC MOTORS.

The Eickmeyer patent, No. 677,308, for an alternating current motor, held valid and infringed.

UNITED STATES FASTENER CO. v. CÆSAR et al.

(Circuit Court, S. D. New York. July 23, 1907. 154 F. R. p. 671.)

PATENTS — INFRINGEMENT — SEPARABLE BUTTONS.

The Pringle patent, No. 720,616, for a stud member of a separable button or fastener, held valid and infringed.

J. F. ROWLEY CO. v. ROWLEY.

(Circuit Court, W. D. Pennsylvania. July 20, 1907. 154 F. R. p. 744.)

TRADE-NAMES-WRONGFUL USE-UNLAWFUL COMPETITION—NAMES OF INDIVIDUALS.

Complainant's president, having built up a large business in the manufacture of artificial legs under his own name, which became widely and favorably known as "Rowley" legs, transferred his business and good will to complainant, which employed defendant, a brother of its president, of the same name, to open an agency in another city. This defendant conducted until a disagreement arose, when he began manufacturing "Rowley Artificial Limbs," and in various other ways, by using the name "Rowley," misleading the public to believe that the limbs sold by defendant were those manufactured by complainant. Held, that defendant was not entitled to use his name in such manner, and that complainant was entitled to an injunction restraining defendant's use of the name "Rowley" in connection with artificial limbs manufactured by him.

SWEET v. BROMLEY & CO.

(Circuit Court, E. D. Pennsylvania. June 12, 1907. 154 F. R. p. 754.)

COPYRIGHT—SUIT FOR INFRINGEMENT—PRELIMINARY INJUNCTION.

Under the rule that, to warrant the granting of a preliminary injunction, the facts must be clear, and the equities growing out of them in no doubt, such an injunction will not be granted in favor of one of two rival publishers of information respecting real estate transfers in a city to restrain the sale of a publication by the other, on the ground that it contains pirated copyrighted matter, where the piracy is denied, as well as the right of complainant to copyright the matter, and a counter charge of piracy is also made in the same connection, and where, moreover, the alleged infringing publication is a year old.

MENZE v. SCHMIDT.

(Circuit Court, D. New Jersey. May 27, 1907. 154 F. R. p. 845.)

PATENTS—INFRINGEMENTS—CITHERNS.

The Menze patents, Nos. 603,699, and 642,472, for improvements in citherns (or zithers) must be strictly and narrowly construed in view of the prior art, and are both limited to an instrument having an offset or recess in its front in which a block provided with keys for sounding the strings is slidingly mounted; and neither are infringed by a construction in which such features are lacking.

H. S. EARLE MFG. CO. v. CLARK & PARSONS CO.

(Circuit Court, D. Maine. July 1, 1907. 154 F. R. p. 851.)

PATENTS—DESIGNS—GRASS HOOKS.

The Earle design patent, No. 30,478, for a grass cutting blade, and the Tilden design patent, No. 32,227, for a grass hook, are each valid design patents; the designs shown being for implements more ornamental and attractive in appearance than those of the prior art, and therefore more salable and "useful," within the meaning of Rev. St. § 4929 [U. S. Comp. St. 1901]. Also, held infringed.

DOVER et al. v. GREENWOOD et al.

(Circuit Court, D. Rhode Island. July 1, 1907. 154 F. R. p. 854.)

PATENTS—SUIT TO OBTAIN PATENT—EVIDENCE.

A suit brought under Rev. St. § 4915 [U. S. Comp. St. 1901, p. 3302], to obtain the issuance of a patent, is not revisory, but an original suit in equity; and testimony taken in interference proceedings before the Patent Office, although between the same parties, is incompetent and inadmissible, unless a foundation is laid for its introduction as secondary evidence.

TAUSSIG v. NORTH WAYNE TOOL CO.

(Circuit Court, D. Maine. July 10, 1907. 154 F. R. p. 856.)

PATENTS—VALIDITY AND INFRINGEMENT—GRASS HOOK.

The Sellers patent No. 529,685, for a grass hook, having as its essential features the handle raised above the level of the blade, and the blade balanced evenly on either side of the handle, is not for a mere aggregation of old elements, but covers a true combination of the two elements which conjointly produce a new and improved result, and discloses invention. Also, held infringed.

J. A. SCRIVEN CO. v. MORRIS et al.

(Circuit Court, D. Maryland. June 21, 1007. 154 F. R. p. 914.)

TRADE-MARKS AND TRADE-NAMES — UNFAIR COMPETITION—EFFECT OF EXPIRATION OF PATENT.

Complainant made and sold men's drawers, under a patent which covered the insertion in the seams of a strip of elastic material; such strip as made by complainant being of knitted fabric made of Egyptian yarn, the natural color of which is yellow or buff, while the body of the garment was of white jean. After the patent expired, complainant continued to make and sell the garments which had become known to the trade and consumers as its product. Held, that it had no longer a monopoly in the right to use such elastic seams, which were the subject-matter of the patent, nor in the right to the color, and that defendants were within their rights, and not chargable with unfair competition in making and selling similar drawers, having a yellow or buff elastic seam, whether made of Egyptian yarn or of American cotton dyed, where the markings of the goods and packages were such as to negative any intention to deceive purchasers as to the origin of the goods, and it being shown that American cotton knit fabric dyed yellow or buff had for many years been extensively used in making underwear, and had been used in connection with white jean prior to such use by complainant, and was a staple article of commerce.

2. SAME—SIMILITUDE IN NAMES OR DESIGNATION OF ARTICLE.

The marking of drawers made by defendants as "Morris Web Seam Drawer" is not such a simulation of complainant's designation of "Elastic Seam Drawer" as to evidence an intention to deceive the public or create confusion; both designations being properly descriptive of the article to which they are applied, and defendant's garments being further plainly marked to show their origin

DAVIS & ROESCH TEMPERATURE CONTROLLING CO. v. ROESCH et al.

(Circuit Court of Appeals, Second Circuit. June 29, 1907. 154 F. R. p. 952.)

PATENTS—INFRINGEMENT—PRESSURE GOVERNOR.

The Roesch patent, No. 717,122, for a pressure governor, claim 5, held valid and infringed by one hot water regulator made by defendants, but, in view of the narrow construction which must be given it on account of the prior art, not infringed by a second regulator.

CHICAGO PNEUMATIC TOOL CO. v. CLEVELAND PNEUMATIC TOOL CO.

(Circuit Court, W. D. Pennsylvania. August 1, 1904. On Rehearing, January 28. 1907. 154 F. R. p. 953.)

PATENTS—INFRINGEMENT-PNEUMATIC TOOL.

The Boyer patent, No. 537,629, for a pneumatic tool, held not infringed.

BONG v. ALFRED S. CAMPBELL ART CO.

(Circuit Court of Appeals, Second Circuit. May 30, 1907. 155 F. R. p. 116.)

COPYRIGHT — PAINTING — ASSIGNMENT OF RIGHT.

Where the author or owner of a painting is a citizen or subject of a foreign nation having no reciprocal copyright relations with the United States, and therefore not entitled to copyright such painting under Rev. St. § 4952 [U. S. Comp. St. 1901, p. 3406], as amended by Act March 3, 1891, c. 565, 26 Stat. 1110 [U. S. Comp. St. 1901, p. 3417], he cannot, while retaining the painting itself, convey such right to another.

ÆOLIAN CO. v. HARRY H. JUELG CO.

(Circuit Court of Appeals, Second Circuit. May 3, 1907. 155 F. R. p. 118.)

PATENTS—CONTRIBUTORY INFRINGEMENT—PRELIMINARY INJUNCTION.

A preliminary injunction to restrain contributory infringement of patents covering a piano player by the sale to purchasers of such players of music rolls to be used therewith, in violation of the license contracts under which the instruments were sold by complainant, held properly granted, although the rolls made and sold by defendant were also adapted to be used with other instruments, where the injunction was carefully limited by its terms so as to prohibit only sales of rolls "intended to be used" in players covered by the patents in suit and sold subject to such restrictions.

BRUNSWICK-BALKE-COLLENDER CO. v. H. WAGNER & ADLER CO.

(Circuit Court, S. D. New York. May 3, 1907. 155 F. R. p. 120.)

PATENTS—INFRINGEMENT—POOL TABLES.

The Cunningham patents, Nos. 553,185 and 556,532, the former relating to the construction of a pocket for pool tables having return conduits for balls, and the latter to the conduit, if conceded invention, held not infringed. No. 559,790 to the same inventor, also relating to pockets, is void for lack of invention.

GERMAN-AMERICAN FILTER CO. OF NEW YORK v. LOEW FILTER & MFG. CO. et al.

(Circuit Court, N. D. Ohio, E. D. July 5, 1907. 155 F. R. p. 124.)

PATENTS—ANTICIPATION — FILTERING PROCESS FOR BEER.

The Stockheim patent, No. 378,379, for a process for filtering beer when drawn off from the store cask into the keg or other selling receptacle, the essential feature of the invention being to prevent foaming in the filter by means of forward and back pressure and to keep the filter at all times full of solid beer, held not anticipated, valid, and infringed.

JOHNS-PRATT CO. v. SACHS CO. et al.

(Circuit Court, D. Connecticut. July 18, 1907. 155 F. R. p. 129.)

PATENTS—SUIT FOR INFRINGEMENT—PRELIMINARY INJUNCTION.

A preliminary injunction against infringement of the Sachs patent, No. 660,341, for an electrical safety fuse, denied, where upon the showing made there was a serious question whether the article made and sold by defendants embodied the invention of the patent, and it also appeared that similar articles were generally made by others and for sale in open market, and that the injunction, if granted, would cause serious loss to defendants.

HENDEY MACHINE CO. et al. v. PRENTICE BROS. CO.

(Circuit Court, D. Massachusetts. August 2, 1907. 155 F. R. p. 133.)

PATENTS—INFRINGEMENT-FEED MECHANISM FOR SCREW CUTTING LATHES.

The Norton patent, No. 470,591, for a feed mechanism for screw cutting lathes, limited to the precise combination of old elements shown and claimed, as it must be in view of the prior art, held not infringed by the machine of the Newton patent, No. 787,537, in which the cone gears are not located on the feed shaft as specifically described in each claim of the Norton patent.

RICHARDS et al. v. MEISSNER et al.

(Circuit Court, E. D. Missouri, E. D. June 19, 1907. 155 F. R. p. 153.)

PATENTS—SUIT TO COMPEL ISSUANCE—ISSUANCE AND PROOFS.

The government is treated as a party to all actions in which the validity of a patent is involved, in order that it may protect the public against a monopoly granted to one who is not entitled thereto, and in a suit under Rev. St. § 4915 [Comp. St. 1901, p. 3392], to compel the issuance of a patent to complainant for an invention for which one was granted to defendant, evidence is admissible to show that defendant's patent is void for anticipation, although no such issue is made by the pleadings, and although such evidence may defeat the action.

UNDERWOOD TYPWRITER CO. v. GRAVES TYPEWRITER CO. et al.

(Circuit Court, S. D. New York. June 10, 1907. 155 F. R. p. 338.)

PATENTS—INFRINGEMENT—TABULATING ATTACHMENT FOR TYPEWRITERS.

The Gathright patent, No. 436,916, for a tabulating attachment for typewriters, as previously construed by the Circuit Court of Appeals, held infringed, on motion for a preliminary injunction

SHARP v. BELLINGER et al.

(Circuit Court, N. D. New York. July 23, 1907. 155 F. R. p. 139.)

PATENTS— SUIT FOR INFRINGEMENT — PRELIMINARY INJUNCTION.

A motion for a preliminary injunction against infringement of a patent denied, where the patent was new and unadjudicated and not a pioneer and infringement was denied and in doubt on the showing made.

STEEL PROTECTED CONCRETE CO et al. v. CENTRAL IMPROVEMENT & CONTRACTING CO.

(Circuit Court E. D. Louisiana. 155 F. R. p. 279.)

1. PATENTS—ANTICIPATION — CORNER BAR FOR CONCRETE CURBING.

The Wainright patents, Nos 428,432, 614,587, and 727,233, all for improvements in the construction of concrete curbing, are void as to the metal corner bar shown therein for protecting the upper and outer corner of the curb, which is mentioned in the first, and shown in the drawings, and forms the subject-matter of the two latter patents; the general idea of such a protecting bar having been shown in a patent granted to Coignet in 1869, and none of the Wainwright patents disclosing any patentable improvements thereon.

2. SAME—SUIT FOR INFRINGEMENT— ESTOPPEL.

Quære, whether a defendant sued for infringement of a patent who asserts the validity of a junior patent which is clearly a copy of defendants', is not estopped to deny the validity of the latter.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Andrew H. Ford, inventor; W. E. Patterson, assignee, Lake Charles, La. Smoke Consumer.—An object of this invention is to provide a smoke consumer and artificial draft, adapted to be readily applied to steam furnaces and capable of enabling the heat within the furnaces to be maintained at a a sufficiently high temperature to consume the smoke and other products of combustion. whereby smoke is prevented and the amount of fuel consumed is materially lessened. Another object of the invention is to provide a steam jet, adapted to produce the necessary draft within a steam furnace without admitting cold air in sufficient quantities to reduce the temperature to a point below that at which smoke and other gaseous products are consumed. and without filling the fire-box full of steam and thereby choking and smothering the fire.

Henry Barry, Chicago, Ill. Weed Extractor.—The object of this invention is to provide a simple article, by means of which weeds can be effectively extracted with rapidity, each weed being expelled from the article by the next one pulled. The device consists of a long handle having a tubular body at one end, provided with a sharpened edge and an opening in one side, through which the weeds are expelled. A strap is arranged in rear of the opening to guide the weeds therethrough.

Henry Barry, Chicago, Ill. Lock.—An object of the invention is to provide a lock constructed also to operate as a latch, and equipped with means for locking the bolt in its extended or engaging position to prevent the same from being retracted without its proper key.

Henry Barry, Chicago, Ill. Milk Top Extractor.—This invention has for its object to provide a milk top extractor adapted to be easily and cheaply manufactured of wire or sheet metal for use as an advertizing novelty, and capable of quickly removing the top of a milk bottle without splashing the contents.

Henry Barry, Chicago, Ill. Butter Cutter.—One of the objects of this invention is to provide a butter cutter, adapted to be readily applied to a tub of butter, and capable of successively cutting the same into layers of the desired thickness, and of dividing or cutting the layers into pounds or other desired quantities and of extracting or removing the same from the tub in a neat and attractive manner without wasting any of the butter. Another object of this invention is to enable an adjustable radially disposed knife to be arranged either in a vertical position for moving it downward through the butter, or at an angle or inclination for severing and slightly raising, and thereby separating a layer from the rest of the mass. The invention also has for its object to enable the knife to adjust itself automatically to the taper of a tub or other receptacle containing the butter.

Henry Barry, Chicago, Ill. Railway Velocipede.—An object of this invention is to provide a railway velocipede adapted to be easily operated by foot power, and capable of being compactly folded when not in use and of being quickly set up and arranged for use.

Silas E. Bailor and Fred M. Ashe, Tarkio, Mo. Cultivator.—An object of this invention is to provide a two-row cultivator for cultivating corn, cotton and other plants in rows or drills, and to increase the adjustment of the cultivating devices, and to enable the same to be readily arranged to correspond with the width of the rows of the plants to be cultivated. Another object of the invention is to improve the construction of that class of cultivators employing a pair of laterally adjustable arches for carrying the cultivating devices, and to enable the cultivating devices of the sides of each arch to be raised and lowered simultaneously, and also to be adjusted independently so that either the inner or outer set or gang of cultivating devices may be raised or lowered to change the depth, or to throw such gang out of operation without changing the depth of the other set or gang of cultivating devices of such arch. It is also an object of the present invention to provide means for equalizing the draft between three draft animals and for enabling the draft to be utilized for forcing the cultivating devices into the soil, and also for controlling the latter operation, so that the desired downward pressure of the cultivating devices may be obtained, to adapt the cultivator both to the character of the soil and to the size and kinds of plants under eultivation.

Silas E. Bailor, Tarkio, Mo. Adjusting Device for Drag Bars or Beams of Cultivators.—An object of the invention is to provide an adjusting device adapted to be readily applied to various kinds of cultivators. and capable of enabling the opposite cultivating devices to be raised and lowered independently or simultaneously, either to adjust them to the desired depth, or to throw one or both of them into or out of operation.

Silas E. Bailor, Tarkio, Mo. Draft Equalizer.—An object of this invention is to provide a draft equalizer, designed particularly for use on cultivators for equalizing the draft between three horses, and characterized by great strength and simplicity in the arrangement of the several parts.

Silas E. Bailor, Tarkio, Mo. Cultivator.—An object of this invention is to provide means for controlling both the gangs of plows and the carrying wheels, to arrange the plows for operating at the desired depth and at the desired distance apart, and to permit the machine to be easily and accurately guided. Another object of the invention is to enable the plows to be adjusted either independently of, or simultaneously with the carrying wheels, by the driver without leaving his seat.

Silas E. Bailor, Tarkio, Mo. Cultivator.—An object of the invention is to improve the construction of cultivators. more especially the means for controlling the gangs of cultivating devices, for enabling the same to be raised and lowered to arrange the plows at the desired depth. Another object of the invention is the provision of an adjusting device capable of enabling the members of each gang of plows to be raised and lowered, both simultaneously and independently with a single operating lever, and of automatically locking one of the members in its adjustment when the adjusting device is set for raising and lowering the other member. Another object of the invention is to equip the cultivator with means for adjusting the gangs of plows toward and from each other, and for swinging the same laterally and simultaneously with the carrying wheels for turning the machine. A further object of the invention is to enable the gangs of plows and the carrying wheels to be shifted laterally, either by hand or foot, in guiding the machine.

Silas E. Bailor, Tarkio, Mo. Cultivator.—An object of the invention is to provide means for enabling the members of the several gangs of plow or cultivator beams to be adjusted independently of each other, to arrange the cultivators either at the same elevation or irregularly to suit the character of the soil. Another object of the invention is to improve the construction of the means for operating the shiftable connection between the carrying wheels, for changing the direction of the cultivator, and to dispense with the oscillatory segment and reversely arranged connections heretofore employed for this purpose.

Silas E. Bailor, Tarkio, Mo. Draft Equalizer.—An object of the invention is to provide a draft equalizer, adapted to be readily mounted on a cultivator having laterally adjustable arches, and to enable the draft equalizer to exert a downward pressure on the cultivating devices for holding the same in the soil. Another object of the invention is to provide a draft equalizer adapted to permit a limited lateral oscillatory movement of the means for connecting the whiffletrees with the equalizing levers.

Edwin F. Henderson, West Allis, Wisc. Sash Holder.—The principal object of this invention is to positively lock both sashes of a window against vertical movement when in any open position, viz., when both sashes are open, or when one sash is open and the other is closed. Another object of the invention is to provide a sash lock capable of quick and easy manipulation and adapted for use on all windows having slidable window sashes.

Edwin F. Henderson, West Allis, Wisc. Curtain Fixture.—An object of this invention is to provide a curtain fixture adapted to enable a curtain or window shade to be quickly secured to a window without the use of brackets or similar devices, and capable of ready adjustment to fit window shades of different widths, and of preventing the same from being torn, soiled, rumpled or otherwise injured at the bottom while raising and lowering the curtain.

William T. Robinson, Mt. Forest, Ontario, Canada. Necktie Fastener.—An object of this invention is to provide a necktie fastener, designed particularly for summer use and adapted to be entirely concealed by the ends of an necktie so as to be invisible when a vest is not worn. Another object of the invention is to provide a necktie fastener having a clamping means for engaging the bosom of a shirt at one end of a four-in-hand or analagous necktie, and equipped with a separate fastening device adapted to positively engage the other end of the necktie at any point for holding the same in any position.

William T. Robinson, Mt. Forest, Ontario, Canada, inventor; C. I. Chubbuck. San Francisco, Cal., assignee. Cuff Holder.—An object of this invention is to provide a cuff holder, designed especially for connecting cuffs directly to coat sleeves so that the former may be independent of shirt sleeves and thereby removable with the coat. Another object of the invention is to arrange the cuff engaging member of the device at the rear edge of the cuff, to avoid the wearing of the button holes, and to also materially facilitate the application and removal of the device and at the same time insure an effective engagement with the cuff.

William T. Robinson, Mt. Forest, Ontario, Canada, inventor; H. A. Bateman, New York. N. Y., assignee. Cuff Holder.—An object of this invention is to provide a cuff holder applicable to all styles and sizes of cuffs, and equipped with means for engaging the interior of the sleeve of a coat, and adapted to be moved inward or outward by a slight touch of the finger, to raise and lower the cuff and to arrange the latter wholly within the coat sleeve, so as to be out of the way when desired.

William T. Wood, Nashville, Tenn. Vapor Lamp.—An object of this invention is to provide a lamp wherein liquid is converted into vapor, which in turn is mixed with air and afterwards burned to cause the incandescence of a mantle.

William T. Wood, Nashville, Tenn. Hydrocarbon Burner.—An object of this invention is to provide a hydrocarbon burner, designed for incandescent lighting from kerosene oil, and capable of effectually eliminating sweating, dripping, condensation and all foul odors usually resulting from burners of this class using kerosene. Another object of the invention is to provide a hydrocarbon burner in which the parts will be compactly arranged, and which by reason of such compactness will enable the vaporizer and other parts of the burner to be sufficiently heated without the employment of supplemental burners or subflames. It is also an object of the invention to reduce the carbon deposited to a minimum, and enable the parts to be readily and quickly cleaned when necessary.

William T. Wood, inventor; Fred O. Wallace, assignee, Nashville, Tenn. Inhaler.—An object of the invention is to provide an inhaler of sufficiently compact form to enable it to be worn on or connected with the finger of the user at night while asleep, so that it will be ready for instant application in case the person wearing it should awake. Another object of the invention is to provide an inhaler equipped with a conveniently arranged mop, adapted to be readily detached and replaced, and designed to be saturated with a healing agent for toothache, or for the treatment of any other ailment.

William T. Wood, Nashville, Tenn. Toy Frog.—An object of the invention is to provide a toy frog, adapted to leap a considerable distance through the air, and capable of rebounding and thereby presenting an appearance similar to that of a live frog. Another object of the invention is to equip the toy with a device adapted to produce a note or sound characteristic of a frog or other animal while the toy is in the air.

William T. Wood, Nashville, Tenn. —An object of this invention is to provide an amusing and instructive toy, adapted to furnish lessons in natural history by illustrating the traits of various animals.

John D. Williams, Lewisville, N. C. Operating Table.—An object of the invention is to provide a foldable emergency operating table, designed particularly for country practice. and adapted for the purpose of minor surgical operations and for administering vaginal douches and the like, and capable of being conveniently carried under the seat of an ordinary buggy. Another object of the invention is to provide an operating table of this character, adapted to be readily introduced in a partially folded condition beneath a patient in bed to permit of convenient handling in transferring the patient from one bed to another, and in carrying patients to and from ambulances. The invention also has for its object to permit the patient to lie in a comfortable position without strain.

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FOR SALE or royalty—Animal toys made from card board or paper material. Cheaply manufactured. Amusing and instructive. Would be great sellers. Address, W. T. Wood, Nashville, Tenn. nov

FOR SALE—Seven new patents—brooders or incubators; apparatus for cotton spinning; funnels for filling bottles; ring knot twine cutter; also British patents. Address, John H. Turcotte, 69 Union St., Springfield, Mass. nov

FOR SALE—Patent No. 886,243, dated April 28, 1908. A washing machine stove that rubs and also boils the cloths in the same vessel. Will sell any way to suit purchaser. Address, M. A. Patten, Milltown, Ga. nov

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FOR SALE—Patent No. 890,048, dated June 9, 1908. Apparatus for holding and dispensing air-tight canned goods, such as vegetables, fruits, etc., put up boiling hot and in any desirable quantity to be drawn off at will, without admitting air to the remainder. Address, J. M. Groce, Parkersburg, W. Va. nov

FOR SALE or royalty—U.S. Patent No. 855,998, dated June 4, 1907. Draft Rigging for Freight Cars. Has been tried and works finely. Have had calls for same already. Parties interested write H. C. Stickel, Star Junction, Pa. Canadian patent applied for. nov

FOR SALE—Patent on the latest improved tag writing machine. Address, C. F. Shepherd, 723 North Jefferson St., Springfield, Mo. nov

FOR SALE—Patent No. 888,898. Attachment for wagons. Made of spring wire to hold seat in place on farm wagons. Simple, inexpensive, durable and easily attached. Address, Lucius S. Hyde, Spanish, Mont. nov

FOR SALE—Cash or part cash and royalty Patent No. 866,658, dated September 24, 1907. Also Canadian patent. Window Reflector. Very useful. Address, Mrs. C. J. Johnsen, 307 John St., Whiting, Indiana. nov

WANTED.

WANTED—An individual or corporation to undertake the manufacture of Automobile Sled Attachments. Patent No. 888,932. Investigate if interested. Address, H. H. Rohlf, New London, Wisc. nov

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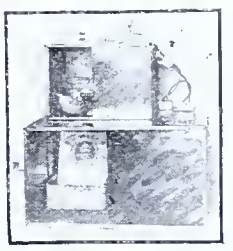
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WASHINGTON, D. C., NOVEMBER 1, 1908.

The Art of Flying.

Never in the history of aeronautics have there been such strides as within the past two years, and in few lines of human endeavor has there been such revolutionary progress—from a record of steady failure to sudden success. All epoch making inventions are received with incredulity: witness the storm of criticism aroused by the steamship, the railway, the telegraph; but few discoveries are hooted as generously as were the early efforts of man to fly. It was not until Santos Dumont managed to encircle the Eiffel Tower with a dirigible balloon that the world stilled its laughter; and it is only within the last few months that the brand of "impracticable" has been removed from the airship. We are no longer surprised at the feats that are performed with balloons. The young Brazilian himself, in spite of his triumphs, has given up this form of flying machine and has turned the full tide of his enthusiastic energy toward the aeroplane. Farman, Herring, Bleriot, Curtiss and the Wright brothers have accustomed us to the wonders of this form of locomotion. It has been conclusively proved that with a powerful light motor, almost anything with a large surface can be made to rise in the air; after that, it is only a question of control. Our army and navy have resolved to employ airships, and the results of the experiments for a satisfactory vessel are described in another column. Since that article was written, the world's record has again been broken by Wilbur Wright, in trials with two passengers in France. In spite of occasional mishaps, it is safe to believe that the secret of flying has at last been revealed to mankind.

Copyrights on Phonographic Productions.

Recent action by the French courts revives interest in the question of copyright protection for music played on automatic instruments. Composers in this country have been fighting against the use of their works on pianolas, graphophones and similar apparatus, on the plea that they are copyrighted and should not be reproduced without the payment of royalty. The matter came up before Congress at the last session, in the consideration of a copyright bill, but before final action was taken our legislators adjourned for the summer. A test case, however, was taken to the U. S. Supreme Court, the resulting decision being in favor of the pianola company. It was held that as the perforated sheets used could be made serviceable only in connection with the pianola and could not be read, it did not violate the copyright law to reproduce music in this manner. Now comes the news of a French legal decision in a similar case, involving cinematograph entertainments. The court declared that unauthorized reproductions of operas, dramas and pantomines by means of the cinematograph constitute direct infringements of the authors' rights. Such reproductions were therefore held illegal, and the court ordered the films, wherever found, to be impounded and destroyed. By this judgment, cinematograph films or bands reproducing scenes from operas or plays are rendered equivalent to printed copies of the music or words of duly copyrighted operas or plays. The decision was given in connection with an action brought by the heirs of Gounod, the famous composer, and by other French writers whose works are being reproduced in their own country without the payment of royalty to the holders of the copyright. It will be noted that the French court, in this instance, took an opposite view of the question to that held by our own supreme tribunal, and it remains to be seen if this precedent will have any weight with our legislators at the coming session of Congress. If so, it will have a far-reaching effect, as moving pictures and five-cent theatres have become an institution in our country, and represent an important factor in our social development. It is estimated that these shows attract four times as many people as do the ordinary theatres, and that they have an opportunity of reaching the masses far greater than that possessed by churches. The latest development in this line (and one that promises to be most popular) is the talking attachment, in which, as the pictures are presented to the eye, the words of those taking part in them are simultaneously reproduced by means of a phonograph. Plays and operas are thus presented with great success. The forthcoming action of Congress will therefore be of interest to millions of people.

Paying for Air.

"As free as air," is no longer an axiom. This element has been supposed to be the common property of all living things: but it, too, has fallen into the clutches of commercialism. Air is bought, sold and rented as a regular business in our large cities, and the latest is the creation of a trust in this particular element. Sunlight has long been a commodity of price in the crowded districts, as those who rent apartments facing south know to the sorrow of their purses: but the air business is the direct development of the boom in sky scrapers, which require more than their share of oxygen. Far-seeing speculators in New York have in many cases obtained such a monopoly of the air supply that owners of towering structures cannot obtain air in the open market, but must pay fancy prices for it.

The air bought and sold is not piped in from great tanks, like gas, nor is it furnished in condensed form, like oxygen, in small cylinders. It is simply the open air between the roof and the sky, which New York operators, having already possessed themselves of the earth, have learned to control and put an arbitrary value on. In order to obtain the wherewithal to breathe, the owners of sky scrapers are obliged to pay a heavy consideration to their neighbors, to prevent their blocking up the windows of their apartments. They rent the air, paying so much for a period of years, the covenant being that no impediment shall be placed in the way of free circulation of the atmosphere. The English law gives an owner of propery the right to easement for light and air along the party line of a lot; but there are no such legal provisions in this country, and the lack of them has led to this most curious of modern traffics.

Hatching Chicks by Electricity.

A moral tragedy is impending in the poultry family, and the hen is the threatened victim. This humble and faithful fowl, which the world has been inclined to treat as a negligable quantity, has been proven to be one of the most important factors in agricultural industry. Last year, the American hen rolled up dividends that rivaled those of the Standard Oil. Next to the trusts, she has been found to be one of the best ways to make money. More than $600,000,000 was produced by our poultry last year, and this industry is increasing at such a rate that figures cannot keep up with it. Poultry products are more valuable than the wheat crop. Nevertheless the hen, the basis of all this wealth, is menaced in her tenderest affections—her maternal sentiment. The hen is the model of domestic virtues. She does her duty patiently and persistently. No better example of concentration of purpose is given by Nature, than a hen whose mind is fixed on setting. Race suicide is as unknown among hens as is the bachelor pullet. She is devoted to her offspring; and now she is about to be deprived of the pleasure of caring for her wee chicks. Already, artificial brooders and incubators have limited the joy of living for her, but electricity is about to be enlisted against the defenseless fowl, and it is time for philanthropy to take notice. Electric incubators are ready to be put on the market, guaranteed to do all that a hen can do in the way of hatching, and to do it better. Biddy will be expected in the future to have only the thankless task of laying eggs; the fruition of her efforts will be denied her. Toil without recompense will be her lot, unless the S. P. C. A. interferes in her behalf.

Photographs in Colors.

There have been many rumors of processes by which photographs could be made in colors, but all have proven impractical. It is to be hoped that the latest report will have a better foundation. Two expert photographers in Paris, Auguste and Louis Lumiere, have announced the perfection of a method by which color photography can be attained in a simple manner, and they have also carried a step further the puzzling problem of reproducing the pictures on white paper in the tints indicated on the colored negatives.

The invention consists of self-coloring or autochrome plates, that are equally sensitive to all rays of all colors, and are adapted to any ordinary camera. As all who have taken photographs know, the relative values of colors in a scene are destroyed when transferred to a plate. Red becomes black, blue white, etc. The underlying principle of color photography is to reproduce these colors in their relative values, so that the picture on the plate shall be relatively the same as the image in the eye. Heretofore, this effect has been obtained, to an extent, by filtering the picture through screens of colored glass inserted in the camera in front of the plate. The process was elaborate, and success depended largely on the scientific expertness of the photographer. The Lumiere invention consists in placing a layer of colored grains in front of the sensitive material on the plate, thus making color photography as simple, relatively, as taking an ordinary picture. The grains not of the color of the object photographed are masked by a blackening of the sensitive material, and the grains remaining visible, therefore, represent the color of the object.

The grains are made of corn starch or potato flour, ground up very fine. The particles are colored green, violet and orange, and are thoroughly mixed and laid on the plate. Then the minute spaces between the grains are filled with an exceedingly fine charcoal dust.

The green, violet and orange thus

placed on the plate are the complementary shades of the primary colors, which are red, yellow and orange. In the negative the red of nature appears as green, the yellow as violet, and the blue as orange. The grains are transparent, permitting the light to pass through them to the sensitive plate, but modifying it by their color, and preserving the relative values of the tints in the original scene.

It is in the development of the plates, however, that the Lumiere process is considered most interesting by scientists. The novelty lies in the method of converting the negative into a positive, and obtaining a single colored photograph on glass. They do not destroy the silver bromide on the plate, as is usually done, but place the plate in a bath, destroy the negative, and develop the rest of the silver salt into a positive. The method is best understood by an explanation of its details. The example selected for the French accounts of the invention is the flag of that nation, in blue, white and red. As the rays from the blue part of the flag pass to the plate, they are absorbed by the orange grains on the film, while the green and violet rays permit the light to act on the sensitive medium. In developing, the bromide of silver will blacken under the green and violet grains, which the medium will mask, and leave transparent only the orange grains. The rays from the white in the flag will not be absorbed, and will blacken the sensitive layer under all the colored grains. The rays from the red will be absorbed by the green grains, the latter remaining transparent. These rays will affect the bromide of silver under the violet and orange grains, which will be hidden, leaving the green visible. The plate then gives the complementary colors of the original, and the flag seems to be three strips of orange, black and green. The reduced silver is dissolved by the permanganate of potash process, and the negative is then transformed into a positive, in the sunlight, thus reproducing the colors of the original with accuracy.

The reduced bromide of silver in the orange, which obscures the violet and green, is dissolved by permanganate, and in the second development the bromide not reduced blackens under the orange grains. These being masked, and the violet-green grains now being exposed, the two combined give the effect of blue. The white is formed by all the reduced silver being dissolved in the black zone, thus reproducing the three primary elements —orange, green and violet. The red section is represented at this stage by what seems to be a block of green. The grains are marked by the second development, and the illusion of red is produced by the mixture of violet and orange.

If this process does all that is claimed for it, copies of paintings and objects of art may be preserved for years in all the brilliancy of the original colors. Sunsets, Presidential inaugurations—any scene full of color may be reproduced at will. In brief, one of the greatest rewards of modern endeavor will be realized.

Fireless Stoves.

Descriptions of self-cookers, or fireless stoves, have from time to time appeared in the INVENTIVE AGE. This form of appparatus has been in use in Europe for a number of years, and has also been found successful in the United States army. The earlier types were merely boxes constructed with double walls, inside of which the food, after being heated, was placed and left to be cooked by the retained heat for a number of hours, or until ready to serve. The latest in this line is a fireless stove that not only coeks, but fries, this process being effected by means of a hot stone. The latter is thoroughly heated and placed in the cooker with the food. After being closed for an hour or so, the box is opened, and the food is fully prepared. In the new cookers, the processes of cooking, frying and roasting may proceed at the same time without the necessity of supervision. This device has become very popular in Germany, where fuel is scarce and dear; and thousands of these cookers have been sold to residents of the Fatherland.

Machine for Making Fish Nets.

Norway is the land of sturdy sailors and fishermen, and it is appropriate that a Norwegian should have invented a new machine for making nets, to be run by hand power, which is said to produce a knot of just the kind that is made by the fingers. The thread is carried on a spool, and the rows of meshes, as formed, are carried non a long steel arm, at one end of which is arranged mechanism to keep the rows parallel during the construction of the net. This has the effect of giving the net a good hang. The whole is operated by a wheel with a handle. There is no limit to the length of the net which can be produced. The arm which carries the rows can be made longer as desired. The machine, which works at the rate of about 70 knots a minute, can be placed on the market at a price not exceeding $90.

Paper from Sawdust.

In the impending scarcity of wood for the manufacture of pulp, paper men all over the world are constantly on the look out for some other raw material to use as a substitute. The organization of a company in British Columbia to make paper from sawdust has therefore attracted unusual attention. This company, according to our consul at Vancouver, has a capital of a million dollors, and will use the vast waste material from the shingle mills, including the sawdust, which is now burned to prevent accumulation. It is intended to convey the refuse of the local mills, of which there are some three thousand tons in that vicinity, in specially prepared scows to the plant, where the mass is to be disintegrated into suitable fineness for conversion into wood pulp.

One of the innovations of the new company is a process whereby it can use the waste of Douglas fir and other resinous woods in the manufacture of pulp. Papermakers in the past have never been able to use woods containing pitch and resin for this purpose, owing to the difficulty in separating the cellulose from the pitch, resin and essential oils. By the new method, all these parts are passed off in vapor, and the fiber is recovered by subjecting the mass to a system of pressing.

The wood, after being reduced to the proper size, is passed into a digester, which is filled with a solution of caustic soda, and the mass is subjected to steam pressure until the cellulose is released. It then passes to a beating machine, and is afterwards washed, bleached by a solution of chloride of lime, refined, and is ready to be turned into merchantable paper of various characters and fineness.

Catching Moths.

The Germans have discovered a method of catching moths, that promises to put an end to the caterpillar plague, which is ravaging the trees in that country. They have found a way of exterminating the moths which lay the eggs from which the caterpillars come in huge quantities.

What is called an electric light trap is employed for this purpose. It consists of two large and powerful reflectors placed over a deep receptacle, and powerful exhaust fans. The whole has been erected on top of an electric plant. At night two great streams of light are thrown from the reflectors upon the distant woods, and the moths, drawn in thousands by the light, come fluttering towards the trap. When they get to a certain distance from the reflectors the exhaust fans take up their work, and powerful currents of air catch the insects and carry them into the receptacle. No less than three tons of moths are caught in a night, and it is believed these troublesome insects will shortly be practically exterminated.

Lifebelt of Soot.

The most striking thing about a new lifebelt, which, it is claimed, has many advantages over the regulation belt, is that it is largely composed of soot. It consists of two cushions filled with a preparation of which the chief ingredient is soot, and these are attached to each other by sidestraps. One cushion rests on the chest, the other across the shoulders, and the connecting straps lie under the arms. It is claimed that the new device does away with the awkward tendency of the older belt to make the wearer turn turtle, and that a person using it cannot possibly lose his perpendicular position in the water. Simplicity, ease of adjustment, and great buoyancy are also claimed for the new belt. The weight of the apparatus is between 6 and 7 pounds, and practical demonstrations of its usefulness have been given before the British admiralty. As described in dispatches from London, the belts were strapped to the waists of nine sailors, some of whom could not swim, and at a given signal they jumped into the water together. Each was enjoined to remain motionless, with his hands above his head, in order to show that it was possible to keep afloat and in an upright position. In spite of a heavy swell, the experiments were regarded as highly satisfactory.

Preserving Milk by Freezing.

Experiments in Germany have shown that pure milk, when frozen, preserves its original properties for weeks. One of our consuls reports that frozen specimens kept for a month showed on thawing no change in taste, and fewer bacteria than before they were frozen. It is suggested that this is a good way of keeping milk for journeys, on ships, etc. Fresh milk could be frozen in the proper containers by submerging them in brine chilled below the melting point of ice. Or it might be delivered to consumers at a distance by this method. Frozen milk so prepared remains solid for a day or more before melting, just as ice harvested during a very cold season keeps better than that gathered in a mild winter.

Spider Threads.

The cultivation of certain species of spiders solely for the fine threads which they weave has an important bearing upon astronomy, the oldest physical science. No substitute for the spider's thread has yet been found for bisecting the screw of the micrometer used for determining the positions and motions of the stars. Not only because of the remarkable fineness of the threads are they valuable, but because of their durable qualities.

Recently the set of spider lines in the micrometer of the transit instrument at the Alleghany Observatory were examined and found to be in good condition, though they had been in use for 47 years. These threads withstand changes in temperature, so that in measuring sunspots they are uninjured, when the heat is so great that the lens of the micrometer eyepiece is often cracked.

These spider lines are only one-fifth to one-sixth of a thousandth of an inch in diameter, compared with which silkworm threads are clumsy. Each line is made up of thousands of microscopic streams of fluid. In placing these lines in the micrometer, experts are employed, who operate with the aid of powerful magnifiers. The lines are placed parallel with each other and two one thousandths of an inch apart.

Piping Fresh Air to Cities.

The supplying of fresh air to cities is no longer a dream of science. It has been given a practical trial in a crowded district of London. The air is drawn into pipes by powerful suction from some high elevation where the sanitary conditions are perfect, and forced into large storage tanks, whence it is distributed through pipes to different houses. The air can be distributed for upwards of a hundred miles without losing its purity. By opening a switch, a customer gets his daily supply of fresh air, the foul air in the rooms being allowed to escape through withdrawal ducts. When once installed in a city, the supply of pure ozone can be made at little cost, and it is calculated that half of the ordinary sickness in congested quarters would be eliminated by its use.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies $1.50.—Please give correct data in ordering.—Address,

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Game-board.....J. B. Rittenhouse
Game or puzzle apparatus.....L. E. Harriss
Garment-clasp.....A. M. Ziegler
Garment-holder.....H. C. Krause
Gas-burner safety attachment.....J. H. Eisenhauer
Gas-engine, Two-cycle.....E. A. Nelson
Gas, Generating water.....H. Strache
Gas-generator.....A. J. Sladek et al
Gas mantle, Inverted incandescent.....S. Cohn
Gas-mantle support.....C. J. Barton
Gas, Manufacturing.....H. Pettibone
Gas-retort charging-machine.....J. West
Gas-retort discharging-machine.....J. West
Gearing.....J. W. Riffie
Golf, Appliance for practicing.....C. M. Treadwell
Grader, Road.....T. Henry
Grain, beans, &c., Grader and cleaner for.....A. Hohner
Grain-elevator, Portable.....J. E. and C. W. Camp
Grinding and polishing machine.....J. M. Thompson
Grinding-machine.....S. Nikoloff
Guns, Breech mechanism of.....A. T. Dawson et al
Hammer-drill.....A. H. Taylor
Hammer, Pneumatic.....T. C. Prouty
Harrow.....F. R. Sosa
Harvester, Cotton.....T. R. and R. D. Hollingsworth
Hasp.....J. Christenson
Hat-pin.....J. D. Banks
Hat-pin.....W. Goldenberg
Heater.....C. E. Varnum
Heel-making machine.....J. L. Rakerd
Hinge.....H. M. Herr
Hinge-support.....T. Settle
Hoe.....W. A. Sparks
Hoist, Electric.....G. Rasmus
Hook and eye.....W. G. Hoffman
Hook and eye.....N. K. Small
Hooks and eyes to tape, &c., Apparatus for attaching.....W. M. Corthell
Horse-blanket fastening.....J. Reichert
Horseshoe.....M. J. Leachey
Horseshoe attachment.....H. D. Hovis
Hose-nozzel.....J. H. Melavin
Hydrocarbon-burner.....A. Beler
Illuminating apparatus.....J. Schmidt
Indicator.....W. O. Haymond et al
Ingots free from blow-holes, Producing.....W. F. M. McCarty
Insect-destroyer.....J. M. Murff
Insect-trap.....T. A. Duggan
Insulator.....T. F. Purves et al
Iron, Refining.....S. B. Sheldon
Ironing-board.....B. T. Ward
Irrigating device.....M. D. McFarlane
Key-ring and door-securer.....L. M. Cooper
Kiln.....J. W. Le Gore
Knit fabric.....J. McNamee
Knockdown chair.....B. W. Middleton
Laboratory apparatus, Electrical.....C. H. Thordarson
Ladder attachment.....E. J. Curran
Ladder, Collapsible step.....J. M. Turner
Lamp, Gas.....C. W. Boyse
Lamp, Incandescent.....F. M. Bennett
Lamp-socket, Plural, 5 pats.....R. B. Benjamin
Lamps, Electrically connecting filaments to supply-wires in electric glow.....H. Kuzel
Lamps, Metal filament for elcetric incandescent.....H. Kuzel
Last.....H. F. Loewer
Last-block.....E. J. Prindle
Lathes, Back-rest for turning.....J. T. Meyers
Leg-covering.....H. Cohen
Lemon-squeezer.....W. S. Schwartz
Lens.....G. A. Macbeth
Leveling and plumbing attachment, Gravity.....G. Durst
Lid-remover.....G. A. Gotchall
Line-tightener.....A. Keck
Liquid-applying device.....H. G. Campbell
Liquids under pressure, Apparatus for subjecting materials to the action of.....L. Détré
Loading device, Wagon.....R. Pederson
Lock.....W. J. Carroll
Lock.....H. F. Keil
Lock.....A. Mercer
Looms, Pile-wire supporter for.....F. W. Roehelle
Lubricator.....J. W. Domville
Mail-bag catcher and deliverer.....J. Wood
Mail-bag catching and delivering appliance.....W. M. Portee
Mail-bag-delivery apparatus.....A. E. Kailer
Mail-bag-delivery apparatus.....W. B. De Witt
Mail-box.....A. B. Rhodes
Mail-box coin-receptacle, Rural.....W. Esselburn
Mail receiving and delivering apparatus.....J. S. Lanier
Mail receiving and delivering mechanism.....J. S. Lanier
Mailing or stamping machine.....R. D. Simpson

Mangling-machine....F. W. Denzler
Manure-loader....F. R. Brown
Manure-spreader....F. E. Shields
Marker, Land....G. B. Randolph
Match-box....E. B. Nichols
Measure, Liquid....C. L. Tate
Measuring and transferring tube, Liquid....O. T. Farnham
Metallic tie....E. Hudson
Metallic tie and rail-joint..W. F. Wilson et al
Micrometer, Quick-adjusting....H. O. Costello
Mining device, Vacuum....J. B. Riddle
Mirror, Adjustable shaving....J. P. Eustis
Moistener....H. G. Campbell
Mold....H. C. Shaw
Molders' patterns, Making....J. F. Cox
Molding-flask pin and guide....J. Rost
Molding-machine bottom-board tightener....W. Bylund
Mower, Lawn....J. C. Reimers
Mowing-machine tedder attachment....W. T. Fiers et al
Mug, Shaving....T. D. McKown
Music-rack....A. De Long, Sr.
Nail-clipper....H. Wilcox
Nails, Machine for driving loose....G. Goddu
Note-sheets, Speed-controlling device for....H. Meyer
Numbering-machine....B. B. Conrad
Nut-lock....T. V. Boyle
Nut-lock....P. C. Haan
Nut-lock....L. Burg
Nut-wrench, 2 pats....G. P. Sprague
Oscillations, Means of obviating the deleterious effects of....C. Feldmann et al
Outlet-box....G. A. Lutz
Oven, Camp....W. H. Hart
Overshoe-holder and trousers-supporter....J. M. Plummer
Ozone, Apparatus for the production of....J. R. Quain
Package....R. P. Beatty
Packing-cups, Machine for forming....C. Swan
Packing device....J. Saunders
Packing for piston-valves and pistons....J. T. Wilson
Packing for pistons and piston-valves....J. T. Wilson
Pail, Milk....J. A. Cornell
Paint, Ship's....A. P. Horn
Paper-holding clamp....D. C. Gray
Passenger-recording system for trains....W. E. Parr
Pattern-cutting device....W. L. Carson et al
Peat-turf into half-stuff, Machine for the reduction of....C. E. Dunn
Peeler, Vegetable....K. Schaal
Pencil-sharpener....A. T. Peterson
Pendulograph....H. Pearce
Perch-support....C. Matthews
Petrol spirit, Apparatus for deodorizing and filtering....A. J. Barnes
Phonograph-cabinets, Megaphone-holder for....S. D. Solomon
Photographs, Producing colored..B. J. Cooper
Piano-case construction....G. G. Hasbrouck
Pianos, Door for automatic....J. Sampere
Pianos, Fall-board mechanism for..C. E. Pryor
Pianos, Means for controlling expression in automatic....H. S. Hornbeck
Picture apparatus, Safety appliance for moving-....A. F. Elkins et al. (Reissue.)
Picture-frame....C. Ward
Picture-molding bracket....E. Christian
Pies and the like, Machine for forming or molding and lidding....J. H. Jackson
Pin and pin-joint....E. W. Morehouse
Pipe and the like, Tool for cutting..J. F. Spitt
Pipe coupling, Train-....A. N. Davis
Pipe-couplings, Middle ring for....J. Clark
Pipe-line, Helically-corrugated....J. D. Isaacs
Plane, Mortising-....M. A. Clark
Planing tool, Floor-....W. W. Scott
Plaster-of-paris, Revitalizing discarded....J. E. Eastwick
Pliers, Milliner's....J. K. Mullenbach
Plow....H. Wiard
Plow....J. Ray
Plow draft device....A. J. Minor
Pneumatic action....H. Meyer
Pneumatic-despatch-tube system....F. H. Wolever
Powder-can....J. Weber
Power-transmitting mechanism....J. J. Gilroy
Pressing device....O. E. Felland
Printing apparatus....A. B. Dick
Printing-machine....A. B. Dick
Printing machinery, Antismutting device for..E. H. Cottrell
Propeller, Boat-....L. C. Butler
Propelling mechanism....R. H. Bowman
Pump....W. H. Heard
Pump, Double-acting wet-air....E. Josse
Pump, Power air-....W. J. Spencer
Pump, Rotary....J. J. O'Donnell
Pump, Rotary air-....H. M. Montgomery
Pump, Vacuum-....W. P. M. Grelck
Pumps and the like, Automatic balancing device for centrifugal....F. A. Griessmann
Puzzle....G. Chapman
Rail-fastening....W. L. Vail, Jr.
Rail-joint....J. D. Stitzell
Rail-joint....J. A. Eicholz
Rail-joint....M. E. Gilcrest
Rail-joint....T. Olsen
Rail-tie....W. H. Mayer et al
Rails, Means of forming joints and bonds in..H. G. Gillmor
Railway, Aerial....F. Hooker
Railway-crossing....F. Halley
Railway-frogs and the like, Heel-block for....W. M. Henderson
Railway rail and bed-plate, Combined....J. C. Phillips
Railway-rail joint or connection, Electrically-conductive....B. G. Braine
Railway-signal....J. Hoffer
Railway-signal, Electric....T. C. Fogarty et al
Railway signal system....M. L. Shepherd
Railway-switch....F. Sallee
Railway-switch frog....A. M. Threewits
Railway-tie....L. A. Miller
Railway-tie....A. A. Whitbred
Railway-tie, Metallic....W. D. Lowry
Ratchet-wrench....W. P. Walker
Razor-blade holder....J. R. Torrey
Razor-stropping device....J. R. Torrey
Receptacle-holder....C. C. Little
Revolution-indicators, Automatic contact mechanism for electric....F. W. Wood
Revolver....T. F. Bowker
Rheostat....H. Poth
Rim-compressor....A. Magnett et al
Roller....J. M. Braly
Rolling plates, 2 pats....A. Lamberton
Rotary engine....F. C. Krüger
Rotary explosive-engine....E. P. Carpenter
Rotary gasolene-engine....C. W. Lindsay
Sad-iron, Self-heating....T. Purvis
Sash fastener, Storm or screen....J. G. Ralph
Saw guide, Undercut....J. W. Pettijohn
Saw jointing and swaging implement..J. Carlin
Saw-set....W. M. Potter
Scale, Truck....E. L. Gage
Scraper and drag, Combined....W. L. Baker
Screw press, Continuous-....R. G. Merz
Sealing and capping bottles....S. C. Bond
Sealing and capping mechanism, Bottle....S. C. Bond
Seed-cleaner....J. H. Hempen
Self-oiling wheel....V. Duff
Sewing-machine....W. C. Free et al
Sewing-machine fly-wheel....W. W. Gould
Sewing-machine thread-measuring mechanism..C. Pedersen
Shade-fixture....D. Whinery
Shade-trimmer....H. M. Fishering
Shaft-coupling, Flexible....G. M. Bartlett
Sharpening machine, Rock-drill-...B. H. Locke
Sheet-feeding apparatus....A. B. Dick
Sheet-feeding apparatus....E. J. Casey
Shock-absorber....J. C. Beck
Shoe....L. O. White
Shoes, Spring attachment for....J. Zooboavch
Shovel and support therefor....J. Austin
Sickle....H. Volckmann
Signal....D. H. Coker et al
Signaling or telegraph apparatus for use on vehicles, Electric....R. B. North
Singe-register....J. W. B. Faris
Skewer....S. C. Reyer
Skirt....A. M. Schneider
Skirt....A. Kasse
Skirt-supporter....P. G. Giroud
Snap-hook....W. A. Schleicher
Soap-holder....P. H. Jungclaus
Soap-holder, Adjustable....G. Goff
Soldering machine, Can-....G. H. Stewart
Sound-reproducing machine....J. Schwan
Sound-reproducing machines, Disk-record attachment for....C. W. Schwank
Spark-gap....I. S. Hirsch
Speed mechanism, Variable-....V. Johnson
Spoke-machine....W. J. Adkins
Spring construction....C. O. Brage
Steam-shovel....C. H. Wolfe
Stirrup, Safety-....T. B. Riley
Stocking-supporter....A. M. Ziegler
Stone-dressing machine....J. C. Armstrong
Stone or marble artificially, Manufacture of....T. M. Thom
Stove, Broiling-....J. H. Zehring
Stoves, Self-supporting shelf for cook-....A. L. Brown
Stump-puller....J. C. Heyman
Suckling arrangement for pigs..A. Grünenwald
Sugar-producing product....G. W. McMullen
Switch and signal mechanism, Interlocking....G. H. Paine
Switch-lock....E. T. Hardin
Table....A. B. Phelan
Tag, Mechanical....F. R. Hoisington
Tanning liquors, Utilizing sapped....G. W. Childs
Tartar, Treating substances containing crude..V. J. Garin et al
Teapot....A. E. Wilson
Telephone apparatus....F. W. Wood
Telephone apparatus, Portable....F. F. Strong
Telephone memorandum-pad....E. J. Casey
Telephone-receiver support....M. M. Kahn
Telephone set....S. S. Sonneborn
Telephone-switch....V. E. Green
Telephone-transmitter....H. F. Albright
Telephones, Phonograph attachment for....A. Hatchett
Telephonic apparatus....F. W. Wood
Telescope, Prismatic double....H. Jacob
Ticket, Merchandise-....T. H. Sherman
Tiling....B. Crosby
Time-controller, Workman's....W. Rockwell
Time-recorder....W. H. Bundy
Tire for wheels, Elastic....F. J. Chary
Tire, Pneumatic....W. Drury
Tire-protectors, Anchoring and tension device for....S. C. Wolfe
Tire, Vehicle-wheel....T. J. Mell
Tobacco-pipe....E. Grundel
Tool, Combination-....J. I. Melton
Tool, Combination-....M. F. Davitt et al
Tools, Brace attachment for fluid-pressure-operated....W. Prellwitz
Top-roll saddle and stirrup....C. A. Pierce
Toy....A. E. Woolnough
Trap-setting device, Animal-....F. F. Ellis
Traveling-grate furnace....J. Harrington
Trolley-wheels from jumping, Device to prevent....W. O. Lane
Truck, Car-....E. A. Curtis
Truck pedestal, Car-....C. Markel
Trunk....S. W. Bonsall
Trunk-lock....J. B. Johnson
Turbine, Elastic-fluid....W. F. and H. A. Lees et al
Type-writer backing-sheet....H. Ohashi
Type-writing machine, 2 pats....J. Felbel
Type-writing machine....J. W. Paul
Universal joint....T. V. Buckwalter
Valve....A. Tomkins
Valve....O. G. Hitchcock
Valve, Automatically-drained gate-....C. A. Claflin
Valve, Dry-pipe....P. Evans
Valve-gear....J. E. Yoder
Valve-gear, Engine....J. S. Spurgeon
Valve, Hopper-....F. L. Sawyer
Valve mechanism, Engine....W. L. Wayrynen
Valve-operating mechanism....M. H. Henesey
Valve, Self-closing measuring-....A. J. Sweet
Vapors, Fractional condensation of....L. Löwenstein
Vegetable-separator....W. J. Sherrard
Vehicle-body hanger....I. Cornwell
Vehicle bow-socket....J. C. Coss
Vehicle-brake....G. Londress
Vehicle-spring, Pneumatic....T. G. Wilkinson
Vehicle-wheel....H. Clifford
Vehicle-wheel....C. Seewald
Vehicles, Sleigh-runner for....S. J. Jennings
Vending-machine....P. J. Regan
Vending-machine....C. E. Morris
Vending-machine....A. Runyon
Vending machine, Cigar-....F. C. Jenkins
Vending-machine, Coin-controlled....R. D. Simpson
Ventilator, 2 pats....W. H. Davidson
Ventilator....P. Evans
Voting-machine....E. McClain
Wagon, Dump-....C. E. Glenn
Wagon, Dump-....J. W. Haywood
Wagon, Dumping-....C. H. Van Deusen
Waist, Child's....K. M. Dowling
Warehouse....A. N. Hadley
Washing device, Compressed-air....J. A. Vance
Watch-regulator....F. W. Buckingham
Water-meter, Positive....E. J. Fryer
Water-motor....J. P. Shevlin
Water-purifier....W. H. Green
Water, Purifying....W. H. Green
Water-supply system, Automatic....J. Johnson
Waterer, Hog-....P. Bernard
Webbing-attacher....J. C. Melick
Wedge for securing the handles of axes, hammers, &c....W. Wyatt
Weigher, Automatic grain-....G. M. Baird
Welding-tool, Gas-heated....A. Futterman
Wheelwright-machine....A. H. Wilson
Winding-machine....J. F. Gordon
Window-catch....A. Macdonald
Window-lifter....N. R. Evans
Window-lock....L. G. Miller
Window-screen....J. A. White
Windrower....L. Franzmeier
Wire-rod-bending machine....M. J. Bartlett
Wire-stretcher....J. Olson
Wire-twisting tool....A. H. Neller
Wrench....P. L. Kimball
Wrench....W. Weidemann
Wrench....R. J. Jones et al
Wrench....A. T. Raiford
Wrench....H. Jeffrey. (Reissue.)
Wringer....D. A. Sawyers

DESIGNS.

Badge, Campaign-....A. M. Parks
Blotting-paper....J. Gibson, Jr.
Carton-holder....H. M. Gale
Chair-back....F. L. Watters
Chair body, Rolling-....C. D. Montague
Cocks, Valve-shell for stop-...H. M. Hoelscher
Desk....W. J. Sally
Eraser....E. McCoy
Flag....M. G. Coker
Leg, Supporting-....J. Allingham
Register stands, Head of hotel-....E. Miller
Vending-machine easing....W. C. Briggs

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MECHANICAL PATENTS.

Acid and sodium sulfate, Manufacture of sulfuric....U. F. Benker
Adding-machine....G. N. Hinchman
Adding-machine....M. C. Crawley
Advertising apparatus....J. Reix
Advertising apparatus....C. E. Petersen
Advertising purposes, Means of using newspaper and like stands for....F. Stebbings
Agitator and decanting filter, Combination....W. A. Hendryx
Air-brake....G. W. McMunn et al
Air-brake system....J. D. Nichol
Air-compressor, Rotary....G. F. Murton
Air purifying and humidifying apparatus....W. G. R. Braemer
Amusement apparatus....J. Z. Levy
Anchor, Guy-....H. M. Thomas
Animal-breeder's bag....F. B. Graham
Animal-trap....E. S. Lipp
Annealing and tempering metals, Process and apparatus for....H. Krautschneider
Baby-walker....M. S. Davis
Bag-cleaning machine....G. M. Hasen
Baling-machine....O. S. and C. F. Lee
Barb-forming machine....J. M. Murphy
Beating-out machine....J. H. Reed
Bed-canopy, Ventilating....J. N. Moody
Bed clothes-retainer, Infant's-....M. Riley
Bed-protector....J. J. Wassam
Bedstead and mattress, Combination....J. F. Stephenson
Bedstead-fastening....L. B. Snyder
Bedstead, Sheet-metal....C. A. Linden et al
Bilge-water ejector....L. Ebbe
Bit extension....F. E. Carlson
Blanket-holding attachment....M. Rockstroh
Block-molding machine....J. Jaeger
Block-signal apparatus....A. Bevan
Block-signaling system, Alternating-current....J. B. Struble
Blowpipe....A. G. Le Chatelier
Boat-releasing device....W. G. Randle
Bobbin-driving means for rotatable spindles....P. E. McCullough
Boiler....W. S. Hawley
Boiler....C. R. Meres
Boiler attachment....C. J. Sheahan
Boiler-cleaner....C. H. Prescott
Boilers, &c., Automatic electric safety device for....C. Kausen
Book, Letter-....R. A. Dunn
Books, journals, paper, music, &c., Binder for..W. Pein
Bookcase....F. J. Honor
Boots, shoes, leggings, &c., Stretcher or filler for....J. N. Cochrane
Bottle....J. A. Gafney
Bottle....J. McGill
Bottle-cap pad....C. Noyes
Bottle-rack....R. B. Colter
Bottle-soaking machine....G. J. Arnold
Bowling-alley, Parlor....C. A. Longwell
Box-blank....W. Fiske
Box-fastener....A. T. Thoits et al
Bracket....C. L. Day
Brake mechanism....E. v. Planta et al
Brake-shoe....B. D. Lockwood et al
Brakes, Automatic sanding apparatus for fluid-pressure....E. G. Desoe
Brick-machine, Rotary....J. Walker
Brick-machines, Brick-handling device for....J. Walker
Bridle-bit....J. W. Greenwood
Bridles, Overdraw check-loop for..M. E. Zeller
Brooder....H. J. Mulder
Brush, Fountain-....H. Kadushin
Buckle....C. Meinhardt
Buckle....M. Barabasz. (Reissue.)
Buckle, Cross-line....R. B. Benford
Buckle, Harness-....L. L. Rounds
Buckle, Rein-....M. E. Zeller
Buckle-shield....J. G. [illegible]
Built-up post....C. F. Steiber
Butter-packing machine....J. Matts
Button-making and like purposes, Press for....J. G. Breitenstein
Cabinet....C. R. Wegener et al
Cabinet, Kitchen supply-....C. A. Horniz
Cabinet, Store-....T. B. Weston
Car-coupling....H. M. Rosenberg
Car-door....W. J. Cooke
Car-door....J. M. Eitman
Car draft-gear, Railway-....C. T. Westlake
Car, Dump-....K. H. Hansen
Car for observation-wheels....A. F. Biavati
Car safety apparatus....T. A. Mayer
Car safety-gate, Railway-....T. F. Talbot, Jr.
Car-seat cushion....J. J. Downey
Car-stake....N. E. Gagnon
Car-stop, Automatic....W. E. Dawkins
Car-wheel....T. M. Crepar
Carbureter....F. H. Heitger
Carpet-fastener....C. E. Billings
Carrier's draft-rigging....E. Ring
Cement or concrete mixer....J. A. Randall
Cheese-cover and show-case....S. Ditson
Churn....I. C. Yarkirk
Chute, Ore-....J. Ross
Cigar-tip....J. O. Therien
Cigarette-machine....O. Berg-strasser
Clamp and buckle for joining webbing....E. H. Erickson
Clinometer....R. M. Staley
Clothes-line holder....J. Huth
Clutch mechanism, Reversing-...F. E. Harthan
Coffee-maker....R. A. Buckner
Collar....S. L. Isham
Concentrator....R. H. Manley
Concrete-mixer....P. A. Koehring
Concrete-mixing drum....P. A. Koehring
Concrete work, Socket for use in..E. A. Purdy
Condenser, Counter-current....O. H. Mueller
Cooker, Combination-....L. L. Chase
Cooling-box....F. A. Nopenz
Core-making apparatus, Green-sand-....J. W. Gibney
Cork-extractor....S. E. Braddock
Corset....T. G. Bowers
Corset....C. B. Howd
Corset....E. G. Hintz
Couch attachment....J. A. Perry
Coupling....E. P. Kinne
Crane, Charging-....C. L. Taylor
Crayons and blowpipes, Stand, gage, and holder for....M. J. Byrd et al
Crushing-mill....W. M. Mueller
Cultivator....W. W. Stauffer
Curtain-pole....V. Brady
Dental casting-machine....H. G. Maize
Desulfurizing-furnace....R. Hübner
Dilator and applicator....W. E. Williams
Dispensing apparatus....W. R. Mittendorf
Display-rack, 2 pats....O. L. Smith
Door-fastener....F. E. Richardson
Door hanger, Rolling-....M. E. Hunt
Door, Metal-covered....W. W. Morey
Door, Metallic....L. I. Heintz
Drain-board bracket....A. Sheret
Drilling-machines, Drill-stem clamp for rotary..H. R. Decker
Drinking-fountain, Stock and poultry....E. E. Norquist
Drum-cylinder motor....J. E. Smith
Drum, Musical....T. Hemberger
Drums or other musical instruments, Snare for....T. Hemberger
Dye, Azo....W. König
Dyes, Making red vat....W. Bauer
Dynamo-governor....C. L. Weichlt
Egg-preserving apparatus....M. Briggs
Electric conductors, Means for protecting high-tension overhead....L. Neu
Electric machine, Dynamo-....A. B. Field
Electric machine of the inclosed type, Dynamo-....A. H. Wouters
Electric separator....H. A. Wentworth
Electric switch....C. A. Clark
Electrical distribution system..W. A. Turbayne
Electroplating apparatus....G. A. Lutz
Engine....I. Erickson
Engine-gear....H. I. Drake
Engine speed-regulator, Gas-....J. B. Schmidt
Exhaust-regulator....O. K. Rauk
Extensible pan....E. L. Carter
Eyeglasses....O. Kampfe
Faller-bar....A. Young
Faucet, Beer-....G. Braybrook
Feed mechanism, Roller....W. A. Leonard
Feeding-trough rack....W. A. McCollough
Fence....P. Howard
Fence-machine....C. E. Merchen
Fence-post multiple mold....C. Kubach
Fertilizer....L. R. Coates
Fertilizer-distributer....E. L. Hahn
Fiber-cleaning machine....A. Pons
Filter....F. Rosenstein
Filter....F. Tiemann
Fire-escapes, Support for flexible...L. Ardengo
Fire-nozzle attachment for valves....J. D. Schierloh
Fire-resisting curtain....E. H. McCloud
Fireproof metal window-frame....F. Lyster
Fish during long periods of transport or in store, Preserving live....F. Kleinschmidt
Fish-trap....T. Morgan
Flat-iron....F. A. Bonroe
Fleshing-machine....L. Rupp
Flower-stake....W. Henshaw
Fly, hook, and leader box, Trout...T. O'Leary
Flying-machine, Dirigible....E. E. Steinhaus
Foot-arch....F. J. Winchell
Force-feed lubricator....G. W. Bird et al
Forceps, Obstetrical....H. E. Koch
Frame....L. Sborigi
Furnace....A. Jay
Furnaces, Air-regulator for....A. Cotton
Furnaces, Gas-burning attachment for....G. G. Weinman
Garment-creaser....G. L. Edgerton
Garment-supporter....C. C. Morris
Gas cut-off, Automatic....H. Niemann
Gas-lighter, Electric....J. D. McIntyre
Gas-machines, Air-pump for....F. M. Campbell
Gas-producer....W. B. Hughes
Gases in air, Apparatus for detecting inflammable....A. Philip et al
Gear for motor-vehicles, Transmission-....E. A. Nelson

Gearing....C. Wiebke
Glass fire-polishing process and apparatus....S. O. Richardson, Jr.
Glass-holder....J. W. Bricker
Gold-saving apparatus....R. G. Steele
Graphophone sound-box....H. Nies
Grapple-fork....M. Kidney
Grate....J. Barker
Grate, Fire-....J. Williamson
Grinding-machine....C. Mills
Gun-sight....J. Y. Bassell et al
Gun-sighting apparatus....A. T. Dawson et al
Guns, Brake mechanism for recoiling....A. T. Dawson et al
Hair-drying comb....T. H. Furman
Hair-retaining comb....W. B. Fisk
Harvester, Corn-....I. A. Stone
Harvester, Tilting sidehill-...H. T. Preble et al
Hasp-lock....C. T. Sleeper
Hat-block....C. E. Stevens
Hat or cap....I. Seitzman
Hay and cattle rack....A. J. Miller
Heating-furnace....W. N. Best
Heating system....H. Salmon
Hog grapple and conveyer....W. D. Farrell
Holder....E. L. Lloyd
Hook and eye....W. Wolf
Horse-detacher....M. J. La Brake
Horseshoe....C. W. Laird
Hose and garment supporter....E. S. Dorman
Hose-rack....C. Nuhring
Hose, Woven....C. A'vord
Hub-attaching device....C. H. Soper
Hulling and cleaning device, Combined....G. A. Huber
Hydraulic elevator....T. Larsson
Ice-walker....W. S. Paulson
Implement, Combination....O. Kampfe
Implement, Pocket....O. Kampfe
Incubator-heater....M. I. Spicer
Insulator for armature-conductors...A. R. Locke
Internal-combustion engines....C. E. Shadall
Internal-combustion engine....W. Rabsilber
Internal-combustion engine....T. W. Hendry
Iron and steel therefrom, Treating ferruginous ore for the manufacture of...M. Moore et al
Ironing-hoard....M. B. Wonsmos et al
Jar and cover holder....I. N. Davis
Keg form and table, Rotary setting-up....F. C. Schultz
Kitchen utensil....A. B. Westrup
Knitted web, Ribbed....R. W. Scott
Knob for pot-covers, Cold....H. C. Parkinson
Lacing-hook-setting machine....J. E. Perrault
Lacing-hook-setting machine...W. Simpson et al
Lifting-jack....F. E. Farnham
Listing-machine....J. F. Mays
Loading and unloading apparatus....E. F. Barrett
Lock....S. H. Shank
Log-loading machine....J. R. McGiffert
Loom, Hand school-....B. E. Lindberg
Loom let-off mechanism....J. Nozarian
Lubricating-cup....C. Stewart
Lunch-heater....C. C. Buren
Mail-bag deliverer and catcher...W. H. Rogers
Mail-chute, 3 pats....J. W. Cutler
Mail-sack catcher....R. H. Millen
Mail-sack exchange mechanism for railways....R. Kersey
Malt-drying apparatus, Green-...J. Elsner et al
Massaging instrument....J. B. Wantz
Measuring apparatus, Automatic electrical....D. J. Shine
Metal part, Structural....E. I. Dodds
Metal patterns from corrosion, Treating and preserving....C. K. Milne
Metals from their ores, Extraction of....J. Turton
Metals from their ores, Separating...I. D. Wolf
Metals from their ores, Separation of....J. D. Wolf
Minerals, Suitable apparatus for concentrating and washing....A. Taylor
Molding-machine....J. A. Rhoult
Mop-head....F. A. Rivers
Mower....F. C. Horak
Music-sheet....H. Pierce
Music-strip-punching apparatus....I. C. Bunge
Music turner, Sheet-....J. C. Myers
Musical instrument or player, Automatic....H. R. Edgecomb
Musical instruments, Action for keyboard stringed....P. Bissing
Nut....J. R. and E. C Winter
Nut-lock....C. W. Stark
Nut lock, Axle-....R. G. Roberts
Oar-blade-shaping machine....W. W. Trevor
Obstetrical appliance....A. M. Reed
Ore-separator, Magnetic....C. E. Stebbins
Ore, Treating....J. T. Jones
Ores containing zinc and other volatilizable metals for the production of oxids, Treating complex....G. M. Rice
Ores, Desulfurizing....K. A. Johansson
Oscillation-detector....C. E. Russell
Packing-case....A. B. and C. F. Boylan et al
Packing, Metallic piston-....E. R. Humphrey et al
Pail, Dinner-....H. B. Waltrip
Paper-clip....R. Corbin
Paper-pulp-screen box....J. Janson
Paper-roll holder....J. McNeil
Paring-machine....L. G. Simpson
Party-line-indicating key, 2 pats....C. C. Bradbury
Peanut-sheller....E. M. Raby
Peramhulator....W. H. Smith
Photoprinting-machines, Automatic fluid-controlled variable-time-exposure valve mechanism for....J. F. Ware et al
Piano-flange....W. W. McCall
Piano, Player-....G. A. Baker, Jr.
Piano-players, &c., Expression and feed control for....R. F. Bancroft
Pick-head usable with removable points....J. Mazlin
Pickax-guard....T. W. Gordon
Picture frame or protective casing....D. W. Fratcher
Pin-box and fastener....H. R. Kimbler
Pipe-fitting....F. Kimche
Pipes or tubes, Apparatus for scouring or cleaning the interiors of....H. W. Bötz
Planing and other machines, Sectional feed-roll for....L. B. Whipple
Planter and fertilizer-dropper....J. Tuggle
Planter, Seed-....W. T. Gibbs
Plow....W. C. Bayless
Powder and for filling wrappers with the same, Device for dividing....L. K. Eastman
Power-transmission device....S. A. Asquith
Power-transmission mechanism...J. O. Michaud
Precious stones, Mounting for....W. R. Elliot
Pressure-governor, Automatic...G. M. Richards
Pressure indicator and regulator....R. Faries
Printing-frame....C. A. Wayland
Printing machines, Ribbon mechanism for type-....A. B. Dick
Printing-plates, Apparatus for the production of process....H. G. Bartholomew et al
Propulsion, Marine....Y. Wadagaki
Protective apparatus, Arrangement of....H. L. van Valkenburg
Pump controller, Pneumatic-....E. W. Conkell
Pump, Hydraulic....J. W. Nelson
Pump-valve....P. J. Doyle
Pumping apparatus....G. J. Murdock
Punch-presses, Clearance device for....R. H. Pearson
Punching-machine....M. J. Riggs
Rail-bond....G. A. Mead
Rail-brace....W. H. Huffman
Rail-chair....G. W. Sutherland
Rail-fastening....H. K. Myers
Rail-joint....H. C. Sandusky
Rail tie and fastener....J. M. Farra
Rails, Device for preventing spreading of....C. L. McVoy
Railway-cross-tie lift....E. L. Barton
Railway electric signaling system....A. P. Rickmire
Railway-rails, Means for connecting parallel...V. A. White
Railway-sleepers, Bed-plate for iron....A. Haarmann
Railway-switches or other devices, Alternating mechanism for operating....M. A. Decs
Railway-tie....R. L. Bower
Railway-tie....W. A. Lockard
Railway-tie....J. C. Reed
Railway-ties, Metallic core for....W. B. Westbrook
Railway track construction....O. B. Grant
Railways and power plants, Electromotor controlling and operating system for electric....J. Sahulka
Railways, Sound-deadening construction for elevated....C. H. Conover et al
Range, Cooking-....K. Luger-Hefel
Receptacle....G. Shields
Recording instrument....J. Harris
Resilient wheel....J. E. McQuilkin
Respiration apparatus....P. Lord
Rolling metal rings, Machine for...I. B. Ritter
Roof....J. C. P. Benson
Roofing-tool....A. Allen
Rotary engine....J. Gill
Rotary engine....A. L. Westrich
Rotary engine....E. Fournier
Running-gear....F. W. Bleckley
Safety-elevator....H. Watson
Safety-pin....F. V. Gage et al
Sanitary protector....A. M. Aiken
Sash and screen fastener....W. O. Hays
Sash attachment, Window-....H. Junge
Sash support, Window-....S. B. Storms
Saw-guard....J. Hohnwood
Saw-handle, Detachable....T. P. J. Coleman
Sawmill set-works....A. A. De Loach
Seed, Metabolism of....J. von der Kammer
Sewing-machine for sewing straw plait....G. Fischer
Sewing-machine needle....A. G. Bradley
Sewing-machines, Devices for controlling the needle-loop on overseaming...R. G. Woodward
Sewing-machines, Thread and sewing-silk regulator for....M. Knapp
Shackle, Padlock-....F. Soley
Shade bracket, Window-....R. C. Loughner
Shaft, Universally-extensible tool-....J. L. Steingässer
Sharpener, Scissors-....J. Fitzgerald
Sharpener, Shears-....E. H. Spafford
Sheet-feeding mechanism....J. Ranz
Sheet-metal-frame construction...E. Ohnstrand
Shirt....L. F. Bowen, Jr.
Shoe-rack....G. B. Gardner et al
Shoes, Arch-supporter for....J. P. Naughton
Show-case for displaying pickles and the like...D. W. Imus
Signaling system, 4 pats....S. Cabot
Slimes-separator....H. G. Nichols
Spacing-machine....G. H. Dyer
Speculum....W. Meyer
Speedometer....J. W. Jones
Spittoon....O. A. Ottosson
Spoke, Metal wheel-....J. R. Welch
Spring-repairer....W. R. Petze
Sprinkler-head....J. A. Cass
Staple making and driving machine...O. Ashton
Step, Extension-....F. X. Yung
Stereotype-plate-casting apparatus....H. F. Bechman
Stirrup and spur, Combined....J. W. Smither et al
Stop-motions, Knock-off guard for....J. T. Hacking et al
Stove....L. Miller
Stove-base....J. Sharon
Stovepipe....L. C. Scott
Stretcher....H. Wilson et al
Sugar-bowl, Spoon-holding....W. Utigard
Superheater....J. H. Meissner
Superphosphate masses, Apparatus for cutting up....F. Griesel
Swinging gate....J. B. Ray
Swingletree-hook....C. C. Enders
Table....R. M. Sheehan
Table....L. E. Canniff
Talking-machine....H. Klenk
Talking-machine sound-box....E. H. Mobley
Target-pigeon....F. B. Mills
Telegraph signals, Apparatus for determining the direction of space-....J. S. Stone
Telegraph-sounder....L. Kihlinger
Telegraphy, Automatic....P. B. Delany
Telegraphy, Space....S. Cabot
Telephone-switchboard....C. E. Wilson
Thermometer-case....F. R. Hart
Thermometers to tanks, vats, or the like, Device for attaching....H. W. Maurer
Ticket or coin holder....J. Hetherington
Tiling....E. M. Kilbride
Tilling fields, Means for....B. J. Godley
Tire, Cushion-....J. G. Smith
Tire holder, Spare-....L. P. McKinney
Tire, Vehicle-....R. M. Merriman
Tobacco-pipe cleaner....D. Lossius
Tool, Combination-....O. Blakeley
Torpedoes, Immersion-regulator particularly adapted for....A. E. Jones
Towel and curtain-pole holder....T. Deselms
Toy....S. Grobl
Toy or puzzle....R. D. Howell
Track or roadway....L. S. Hackney
Traction-wheel....G. Hohleneamp
Trap-door-operating mechanism....L. J. Berg
Trolley-wheel....J. W. Seibert
Truck, Car-....C. H. Howard et al
Turbine....C. A. Parsons et al
Union suit....J. E. Richards
Valve....H. D. Snell
Valve....W. H. Kline. (Reissue.)
Valve, Automatic air-, 2 pats...G. D. Hoffman
Valve for flush-tanks, Supply-....O. F. Glidden
Valve for hydraulic jacks, Air-....J. W. Nelson et al
Valve-handle, 2 pats....W. P. Marble
Valve-position controlling and indicator device...F. N. Connet
Valve, Relief-....J. W. Rowe
Valve system and tracker-board....H. Pierce
Vehicle-bodies, Means for raising....A. J. Pack
Vehicle-guiding means....L. S. Hackney
Vehicle running-gear....M. W. Heyenga
Vehicle spring-wheel....W. H. Scrymgour
Vehicle-wheel....W. H. Scrymgour
Vehicle-wheel....I. C. Scudder
Velocipede, Ice-....O. Pehrman
Vending-machine, Coin-controlled...J. E. Allison
Vent-pipe attachment....J. H. Brown
Wagon-standard....W. W. Mullen
Washing-machines, Mechanical movement for...G. W. Brewer et al
Washing sheet material, Machine for....C. E. Moss
Water-cooler....S. Holub
Water-current motor....A. A. Porter
Water-heater....J. J. Divekey et al
Water-motor....L. C. Lewis
Watering troughs, Guard and cleaning attachment for stock-....E. E. Norquist
Weather-strip....F. A. Yeager
Weed-burner....A. Iten
Well-strainer....E. E. Johnson
Wheels of vehicles, Non-skidding device for...H. H. Kenshole
Winding-machine....L. M. Morrow et al
Wood-boring-machine guard....E. R. King
Wood, Preserving....W. Buehler
Wood, Preserving....C. Howard
Wood, Preserving....W. Buehler
Wood-splitting machine....H. G. Saecker
Woodworking machinery, Feeding device for...J. R. Thomas et al
Wool, Apparatus for extracting grease and potash salts from....F. and C. Shuman
Wool, Extracting grease and potash salts from....F. and C. Shuman
Wrench....H. W. Allison
Wrench....A. L. Shaw

DESIGNS

Automobile-body....O. P. Fritchle
Badge or similar article....L. W. Pennington
Barrette or hair-fastener....G. R. Farrell
Belt....S. M. Riker
Bracket, Supporting-....J. Kaiser
Clock-case foot....R. A. Culver
Collar, Lady's wire....M. V. Maag
Cup....W. F. Rothermund
Game of five hundred, Schedule-card for the...W. B. Champlin
Gas-burner, Inverted....F. M. Brooks
Lamp....E. R. Estep
Lamp....M. J. Wohl et al
Lamp-pedestal....F. S. Verbeek
Lead and crayon holder, Automatic....C. W. Boman
Mail-box....C. H. Baldwin
Pencil-case....E. Pearl
Pencil, Propelling-....H. Heymann
Pincushion....E. Daucher
Pipe-holder....C. Elkin
Pipe trap, Waste-water-....W. J. Frost
Printer's rule-corner....W. C. F. Papke
Racks or drawers, Front member for....D. B. Plunkett
Ring....W. E. Edwards
Shoe-polishing-machine casing...E. F. Stratton
Sign, Druggists'-....R. A. Walter
Spoon....A. Atwood
Stove, Vapor-....G. E. Savage et al
Tire, Wheel-....T. J. Mell
Tray, Glass-holding....O. Hebestreit

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MECHANICAL PATENTS.

Adding-machine....H. L. Fisher
Adding-machine....W. S. Horry
Adjustable rake....J. J. Holley
Adjustable table....A. Marriero et al
Air and gas compressor....F. Elder
Air-brake....A. A. St. Clair
Air-ship....A. R. Silverston
Amusement device....C. Adelhelm
Angle-finder....W. Clark
Animal-trap....W. Fagan
Auger, Hollow....N. E. Swanson
Auscultа-phone....L. A. Townsend
Automobile....T. B. Jeffery
Automobile-wheel....J. Laus, Jr.
Axle-box, Self-oiling....G. C. Benjamin
Axle for motor road-vehicles....J. and A. Niclausse
Axles, Machine for turning cranked....H. W. Jacobs
Bag and blank therefor....P. A. Frye
Bag-closing mechanism....J. Rogers
Bag filling and tying machine....J. Rogers
Bag-tier shears....J. Rogers
Baling-press....A. B. Bennett
Baling-press....J. W. Galhreath
Baling-press....T. Guidry
Band, hand-fastener, and seal combined....J. S. Mark
Bank, Pocket coin-....W. E. Porter
Barometer....J. Nelson
Bearing for vertical shafts, Ball-....A. Riebe
Bed-bottom and frame, Wire....J. N. Rabedew et al
Bed, Recess-....W. E. Ingram et al
Beer, Brewing....L. Nathan et al
Bellows package for distributing powder....S. S. Adams
Bellows-pedal, Folding....C. S. Wright
Belt and belt-fastener....K. Mastele
Belt-guide....N. A. Groat
Belt-tightener....F. L. Lane et al
Blade-fastening....R. A. McKee
Blade-fastening....M. Rotter
Block-molding machine....E. N. Edwards
Blowing-engine....G. B. Petsche
Boat, Life-....R. D. Mayo
Boat-releasing appliance....C. L. Bevins
Boiler blow-off device, Domestic-....J. Manncschmidt, Jr.
Book, Loose-leaf....J. C. Hedges
Bottle-capping machine....W. Cooper
Bottle-case....T. L. Valerius
Bottle-stopper....G. Kirkegaard
Bottle-washing machine, Cased-...T. L. Valerius
Box-machine....L. P. Brown
Box-machines, Automatic glue feeder and spreader for....E. Rothong
Brake-release....A. A. St. Clair
Brick, block, or tile cutter or shaper....W. H. Hill
Broom-making chuck....E. J. Powers
Buckle....F. A. Goodykoontz
Buckle, Snap-fastening slide-...T. R. Hyde, Jr.
Buggy-top attachment....E. Ganoe
Building block or brick....W. H. Daniels
Building-blocks and artificial stone from plastic material....A. A. Pauly
Butter, cheese, and the like, Machine for cutting....F. G. Hodell
Button....A. Hall
Button....J. G. Breitenstein
Button, Upholsterer's....H. L. E. Krueger
Cabinet, Cheese-....C. C. Brown
Cabinet, Ironing-....B. A. Stocking
Cable-clamp....H. B. Newhall
Cable-drum....A. A. Pifer
Cable-power....C. J. Eastman
Cables, Relief-grip for....J. H. Colby
Calendar....E. K. Plough
Can-opener....J. H. Lynch
Canned goods, Revolver for processing....H. L. Forhan
Capsule-filling mechanism....J. P. Remington
Capsule-placing device....J. P. Remington
Car-coupling, Automatic....V. Márton
Car-door construction....J. M. Rush
Car, Dump-....T. H. Stagg
Car-fender....G. F. Walker
Car, Railway-....E. T. Robinson
Car-roof....M. E. Ward
Car-underframe, 3 pats....A. Becker
Car-wheel....O. S. Pulliam
Cars, Detachable log-retaining device for....O. W. Wade
Cars, Street-signal for....N. G. Augir
Cars, Trip-stake and bolster for logging-....F. J. Schmittner
Carbonating and bottling apparatus, Liquid....A. J. Billows
Carriage, Folding....O. N. Turner
Carriage-top....J. P. Fillingham
Carton....G. W. Teasdale
Cartridge-loading machine....W. I. Donaldson
Caster....A. F. W. Bowen
Castings, Cooling....L. Kavanaugh
Central-buffer claw-coupling....L., Sr., and L. Scheib, Jr.
Chair covering, Barber's-....O. H. Willard
Chair-seat....C. H. Lenhart
Change-maker, Automatic....W. W. Roblyer
Chaplet and shrine of the holy rosary....W. Hendrick
China-cleaning....J. Pass
Cigar-wrapper-rolling machine....H. Nageleisen
Clasp....J. V. Newton
Clothes-line fastener....J. G. Schlenter
Clothes presser and hanger....L. Albert
Clutch....H. Ast
Clutch....W. M. Ammerman
Clutch mechanism for automobiles and the like....L. S. Chadwick
Coat and adjustable skirt hanger, Combination....F. Levy
Coin-separator....A. R. Moore
Coke-oven....T. J. Mitchell
Collar cap and fastener, Combination....J. J. Poli
Collar, Horse-....L. J. Powers
Concrete-mixer....N. E. Marsh
Controller-regulator....C. P. Ebersole
Converter....H. Shoemaker
Conveyer....C. D. Seeberger
Copy-holder....M. L. Flynn
Copying apparatus, Exposure-plate for....J. Röttgen et al
Core-molding apparatus....H. W. Bracken
Corking-machine....R. B. Gilchrist
Corn-husking machine....J. F. White
Cotton-picker....J. T. McDonald
Crane, Traveling....A. W. Bright
Cream-separating device....J. H. Reed
Crupper....L. S. Ellis
Cultivating implement....F. H. Weaver
Cultivating-machine....C. Soltész
Cultivator-fender....E. G. Munson
Cultivator or harrow, Rotary....B. F. Stewart
Culvert....J. H. Schlafly
Cup and saucer....D. A. Stewart
Current-motor....J. R. Jeffrey
Cutting-machine....R. F. Coleman
Cycle driving-gear, Motor-....A. Levedahl
Cylinder and piston machines, Increasing the volumetric efficiency of....A. Vogt
Dam....W. M. Ransom
Decoloring oils, fats, &c., and making the same, Composition for....T. Macherski et al
Derrick....F. R. Patch
Digester....C. Edgerton
Disintegrating apparatus....A. D. Furse
Display-rack....F. Hennermann
Ditching-machine....O. T. and O. C. Gullixson
Door, Crane-....J. T. Wallis
Door for lockers....D. Churchill
Door-operating mechanism, 2 pats...J. E. Osmer
Draft-gear, 2 pats....H. T. Krakau
Draft-gear and buffing mechanism....H. T. Krakau
Draft-gear, Radial, 3 pats....H. T. Krakau
Draft-timber protector....A. P. Nordeen
Drag, Road-....F. E. Ott
Drain-inlet guard....A. J. Shepard
Drawers....E. S. Bartram
Dumping device....G. A. Rakowsky
Dust-receptacle....E. G. Adams
Duster and polisher, Floor, 2 pats....G. W. Goodier

Dye and making same, Orange to orange-yellow vat....A. Schaarschmidt
Dye and making same, Violet vat....H. Kraft et al
Egg-case carrier....J. E. Harker
Electric conductors, Connection for....F. H. Ball
Electric installation, Box-connector for....W. H. Vibber
Electric installation, Combined bushing and coupling for....W. H. Vibber
Electric-installation molding-box..W. H. Vibber
Electric switch....C. W. Wachtel
Electric wires, Grounding-clamp for....W. H. Vibber
Electrical-distribution system....A. S. Hubbard
Engine....F. Schneider et al
Engine ignition system, Explosion-..R. Varley
Engine starting device, Gasolene-..F. Reynolds
Engine starting mechanism, Gas-....W. K. Andrew
Engines, Control and fuel-feeding device for internal-combustion....J. T. Dickson
Eraser, Ink-....O. W. Johnson et al
Evaporator....W. Kirkwood
Excavating-machine....O. Hetlesaeter
Explosive, Smokeless....M. Abelli
Explosives, Producing gelatinized nitrocellulose ....G. H. Wadsworth
Extraction apparatus....C. M. Chamberlain
Fan....L. Owen
Fan....O. Selg
Farm-gate....L. Liesmann
Fastener....L. F. Hammer
Feed mechanism....C. A. Hirth
Fence or guard, Wicket....A. L. J. Miller
Fertilizer....L. R. Coates
Fertilizer-distributer....W. E. Warner
Fertilizer-distributer....G. E. Alphin
Fibers, Machine for preparing vegetable....F. Scherr et al
Fifth-wheel....W. H. Divers
Film-developing apparatus, Daylight....J. Le Compte
Filter....C. W. Wright
Fire-alarm....B. B. Mears
Fire-escape....W. P. Huffman et al
Fire-escape ladder....M. J. McArthur
Fire-extinguisher....H. L. Carpenter
Fire-pot or lining....E. G. Germer
Firearms to supports, Clasp for fastening....H. Renfors et al
Fishing-rod tip....F. A. Smith
Flexible pipe....G. F. Royer
Floor-cleaning machine....G. W. Goodier
Floor construction, 2 pats....J. J. Whitacre
Flower, Artificial....W. A. Warner
Flower-support....G. E. Browne
Fluid-meter-testing apparatus, 2 pats....T. B. Dornin
Fluid-pressure motor....J. E. Osmer
Flushing apparatus, Street-....J. Hill
Folding box....C. T. Bloomer
Folding mechanism, Rotary, 2 pats....H. Lang
Food-chopper....J. H. Shaw
Fore-masher....I. Rathgeber
Frame-mounting....O. Hetlesaeter
Freight-conveyer....G. W. Younkman
Furnace grate, Steam-boiler-....H. Schofield
Furnace-tilting mechanism....D. R. Steele
Furnaces, Dust-trap for hot-air....J. M. Sager
Game apparatus....J. G. Patrick
Garment-hanger....F. W. Van Nortwick
Garment, Neck-protecting....M. Rosenbaum et al
Gas-analyzing apparatus....H. J. Westover
Gas-burner....F. Krabal
Gas generator, Acetylene-....E. M. Rosenbluth
Gas generator, Acetylene-..G. W. Fiedler et al
Gas-light fixture....J. Maas
Gas, Manufacturing....H. W. Benner
Gas-producer....W. B. Hughes
Gas-producers, Charger and stirrer for....H. E. Smythe et al
Gas, Producing....W. H. Frost et al
Gas-producing apparatus....J. J. Nix et al
Gases, Apparatus for removing solid and liquid particles from....F. Sepulchre
Gases, Cleaning....A. Ernst
Gate and door closing device....B. Steinman
Glass bottles and other vessels, Machine for the manufacture of....F. H. Pierpont
Gopher-trap....A. Herrmann et al
Governor....R. Siegmund
Governor....W. O. Thomas
Governor, Centrifugal....R. Siegmund
Grain-binder attachment....E. D. Rodemeyer
Grain-distributer....H. B. Bozard
Grate, Shaking-....W. E. Cole
Grate, Vertically-adjustable....J. W. Piper
Grinder, Calk-....D. F. Ensign et al
Grinding band-wheels, Device for....C. E. Payne
Hame-fastener....P. W. Napierala
Harness, Crupper-fastener for...J. E. Varnum
Harvester....C. F. Blakeslee
Hat-brim welting and rounding machine....G. Segschneider
Hat-fastener....E. Seyfried
Hats, Manufacture of one-piece felt....F. J. Muhlfeld
Hay-carrier....M. Thurston
Heater....A. L. Leonard
Heating system (2 pats.)....A. G. Paul
Hinge Box....A. H. Weiss
Hinge-seat gage....H. C. Bunting
Hoe, Adjustable....W. T. Hammett
Hog-trap....R. W. and B. W. Purcell
Hoisting-apparatus controlling device....C. Notbohm et al
Hook-and-eye mount....H. C. Goodrich
Horseshoe....W. E. Spafford
Hose-clamp tool....G. E. Burtscher
Hot-box cooler and oiler....N. E. Barnes
Hub box, Buggy-....J. L. Porter
Ice-cream freezer (3 pats.)....T. L. Valerius
Ice-cream machine....H. K. Burnett et al
Igniter....E. E. Buttles
Ignition-controlling apparatus..C. Mitchell, Jr.
Impregnator....F. B. Graham
Indicator....N. C. Forbus
Ingot-manipulator....D. L. Mekeel
Ingots, Making....F. Cutter
Internal-combustion engine....S. A. Reeve
Ironing-board cloth attachment....J. Michael
Jar-opener....M. Sarvalla et al
Key-guard....N. Pellow
Kiln....H. W. Croft et al
Kinetoscope....G. A. Knaak
Lacing-fastening....W. W. Munsell
Lamp-font-attaching device....W. T. Jones
Lamp, Switchboard signal-....E. B. Craft
Lamps, Combined base-ring and bracket for signal-....G. H. Rolfes
Lathe with several mandrels, Semi-automatic revolving....M. H. Blancke
Lathing, Metal....W. G. Hurlbert
Lavatory-support....A. and G. Coons
Lazy-tong genus, Machanism of the....H. Tideman
Legging....G. Ciociola
Lid-holder....G. A. Schwanke
Life-preserver....H. P. Thorn
Lifting and transporting apparatus...J. Eisner
Liquids, Safety device for the mouths of vessels containing volatile combustible..L. Schon
Load-trimmer....J. T. Johnson et al
Loading apparatus running-gear..F. J. Hassler
Lock....H. G. Collins
Loom, Gauze-....A. Hannah
Loom take-up....B. Wehrlen et al
Loom weft-replenishing machanism....W. Williamson et al
Looping-machine winding attachment....J. P. Barger
Lubricator....J. Noethe
Mail and package collector....P. Martocci
Mail-bags from moving trains, Means for delivering....E. J. Patton
Mail-box....T. W. Anderson
Mail-delivery apparatus....C. E. Reid et al
Mandrel, Collapsible....T. Hansen
Manipulator....J. W. Weber (Reissue.)
Mantel-ring mold....B. D. Kenney
Match-making machine....G. P. Loomis
Measuring device for dressmakers and the like....J. Pohle
Measuring device, Garment-....I. M. R. Campbell
Measuring vessels, &c., Float-controlled device for....J. Meyer
Metal-cutting tool....S. Newbold
Metal-sawing mechanism....A. Tindel
Milk-can....F. H. Richards
Mineral values, Apparatus for recovering....J. W. Boardman
Mines and removing dust and gases therefrom, Means for ventilating....F. T. Byers
Mines, Removing dust and gases from....F. T. Byers
Mining machine, Coal-....L. W. Veitch
Mitt, Base-ball....J. Gamble
Motor starter, Electric-....W. C. O'Brien
Mounting....G. W. Dover
Music-leaf turner....J. W. Albin
Music-sheets, Adjustable spool for....E. De Kleist et al
Nail-puller....W. F. Hobbs
Nailing-machine....F. H Schultz
Necktie spporting-frame....F. W. Raupach
Nest, Automatic trap-....F. S. Barzee
Nitrites, Production of....C. N. Riiber
Nut and bushing for connection-boxes, Combined lock-....J. S. Ritter
Nut-blanks, Tapping....O. A. Smith
Nut-lock....W. A. Smith
Nut-lock....H. Jeffrey
Nut-lock....W. F. Barron
Nut-tapping machine....O. A. Smith
Oil-cloth, Manufacture of....M. Abrahams
Ore-feeder....S. T. Graham
Ore roasting and briqueting apparatus....C. F. Buck
Oven-buildings, Iron structure for....K. Bernhard
Overalls....L. H. Wise
Packing-ring for stuffing-boxes, Hollow....G. Huhn
Pan-holder and stove-lid lifter....B. Kessler
Paper or pasteboard, Compounding-machine for manufacturing....H. C. Hunter
Paraffining vessels, Device for...E. C. Capper
Parcel-carrier....L. Rieder
Parer, Fruit-....D. F. Hunt
Pasteurizing apparatus....L. S. Pfouts. (Reissue.)
Pedal-mounting....C. F. Koester
Peptisating colloidal elements....H. Kuzel
Photographic apparatus....J. B. Low et al
Photographic-film cartridges, Developing-box for....P. Abbott
Photomicrographical apparatus...F. N. Merwin
Piano-violin....O. Kurtz
Piano-violin....W. Klink
Picture for stereoscope and similar devices....E. P. Crocker et al
Picture-frame, Knockdown....F. Parker
Planting-machine....C. E. Patric
Pleasurephone....C. A. Wardner
Plow-moldboard....C. R. McGahey
Pneumatic-despatch systems, Sending mechanism for....C. S. Jennings
Pneumatic drier and conveyer...W. F. Carlton
Pneumatic drill....M. Hardsocg
Post-hole digger....W. Wininger
Pressure-gage....E. S. Wheeler
Pressure-regulator....A. Schum
Primary battery....W. A. F. Bleeck
Printing and registering apparatus, Ticket....M. Lebeis
Printing device....J. J. Sayre
Printing-press rotary folding mechanism....H. P. Husby
Printing-press rotary folding mechanism....H. Lang
Printing-press rotary folding mechanism, 2 pats....J. J. Walser
Printing-press side guide....C. J. McArthur
Printing tubular articles, Apparatus for....J. M. Johnson
Projectile-loading....G. W. Bentieu
Pruning implement....B. F. Talley
Pulling-machine....H. Bickel
Pulley....C. F. Murray
Pulverulent material, Producing solid hard pieces from....L. Wiess
Pump....J. H. Champ
Pump....S. R. Blanchard
Pump, Air-....C. A. Hague
Pump, Double-acting power-....W. Kirkwood
Pump, Gas-, 2 pats....R. Whitaker
Pump valve, Gas-....R. Whitaker
Pumping air and gases, Apparatus for....W. G. Abbott, Jr.
Pumping apparatus, Well-..W. M. Stephenson
Punch....J. F. Doolittle
Push-button....C. W. Wachtel
Puzzle....C. C. Burr
Quill substances, Machine for treating....W. Webster
Quebracho, Treating extracts of....L. Pollak
Rail clamp, Guard-....G. L. Hall
Rail connection....A. S. Lind
Rail contact-shoe guard, Automatic third-....W. E. Hayes
Rail-joint....D. C. Armstrong et al
Rail-joint....C. P. Brown
Rail-joint....E. May
Rail-joint....J. Caputo
Rail tie and fastening....J. H. Lewis
Rail-tie, Metallic....A. S. Kazimer
Railway-coach vestibules, Step-cover for....T. H. Kane et al
Railway signal device....S. Piziczik
Railway-spike....S. S. Keen
Railway-tie....M. C. Williams
Railway-tie....J. D. Hazlet et al
Range....S. R. Stine
Range-boiler....M. Gerstein
Range, Combined coal and gas....C. H. Miller
Razor, Automatic....J. K. Joice
Reaction-chambers, &c., Filling for....H. Petersen
Reaction-chambers, Filling material for....H. Petersen
Reamer-tap....G. T. Reiss
Reaper....T. E. Lind
Reel....O. L. Owen
Revolving chair....H. W. Bolens
Roasting-furnace (2 pats.)....W. A. Rankin
Roasting-furnace....G. F. De Wein
Rock-drilling machines, Water-supplying device for....E. M. Weston
Rolling-mills, Twist-delivery guide for....V. E. Edwards
Roofing-material joint....S. H. Goldberg
Rope-sheave....M. A. Baker
Rotary engine....S. Haudenshield
Rotary press....I. Broome
Rule and level, Plumb....E. M. Haunty
Sack or bag fastener....J. L. Phillips
Safety device or saw-guard....G. Shubert
Salt-cellar....F. A. Dinsmore
Salvar....J. L. Wareham
Sand-mold-charging apparatus, W. H. Wengelin
Sash-adjuster....J. W. Bishop, Jr.
Sash, Slidable and swinging window-....B. Hausmann
Saw mill, Band-....W. H. Trout
Sawmill set-works, Stop mechanism for....J. Walton
Score-keeper....C. O. Wellnitz
Scraper....H. U. Edzards
Sealing means, Vessel-....J. M. Hicks
Sewing-machine-attachment holder....H. M. Greist
Sewing-machine-attachment holder....P. R. Griest
Sewing-machine braider or corder....P. R. Creist
Sewing-machine hemmer....A. Laubscher
Sewing-machine, throat-plate....C. H. Towers
Sewing-machine tuck-creaser....J. M. Greist
Sewing-stand....V. R. Hockstaetter
Shaving-machine....A. Seymour-Jones
Sheet-feeding machine....H. C. La Batt
Sheet-metal-vessel joint....H. M. Bache
Shock-absorber....E. Flentje
Shoe....J. Hessler
Shoe-cleaner....L. L. De Lapp
Shoe, Turned....F. A. Beal
Shoes, Manufacture of....J. Essig
Shutter attachment....J. L. McCaleb
Sign, Phosphorescent....B. G. Kodjbanoff
Signaling system, Selective....H. O. Rugh
Skate, Roller-....T. M. Ferguson
Skimmer....J. S. Golden
Slicer, Bread-....A. Englund
Slip-box....L. Cain
Smoke-cleaning device....J. L. Matthews
Smoke-jack....R. Harcourt
Snow-plow, Rotary....J. F. Murphy
Soap-dispenser....F. M. Stevens
Soldering compound....E. M. and A. Merrell
Solenoid-motor....L. F. Howard
Spanner or wrench....H. L. Minter
Spark-coil, High-potential....C. H. Thordarson
Speed and reversing mechanism, Variable-....N. S. Harter
Speeders or spinning-machines, Top roll for..C. E. Riley
Spinning-machines, Thread-board for....O. L. Owen
Spoke-extractor....L. P. Parent
Spoke, Laminated metal wheel-...J. R. Welch
Spring-wheel....H. E. Heaton
Stairway, Moving....G. A. Wheeler
Stall and manger, Combined cattle....W. D. James
Steam-boiler, Water-tube-circulating....P. W. Burke
Steels, Heat treatment and quenching of alloyed ....J. Churchward
Stock and hay rack for wagons, Combined....H. G. Tille
Stone drying and heating apparatus....L. N. McCarter
Stool, Cane-....M. H. McNamara
Stove....W. R. Yendall, Jr.
Stove for drying molds....C. Morehead
Switch....A. T. Foster
Table slide, Extension-....O. G. Franks
Tag, Jeweler's....C. T. Wittstein
Talking-machine....T. Kraemer
Talking-machine attachment....C. Martelock
Tanks, Apparatus for discharging the contents of septic or settling....S. F. Miller
Tanning extract from peat....E. E. M. Payne
Tap....O. A. Smith
Telephone cut-off....H. S. Gilbert et al
Telephone-exchange apparatus....E. Tanke
Telephone system....A. H. Dyson
Time-actuated mechanism....H. B. Snell
Time-controlled mechanism....M. K. Bauer
Time-recorder, Autograph....W. D. Doremus
Tinning and cleaning machine, Combined....J. Lewis
Tire-inflater for automobiles....P. J. Ross
Tire rim, Convertible pneumatic-..E. K. Baker
Tobacco extract, Manufacture of concentrated ....C. F. Gloystein
Tooth-cleaning device....C. P. Schultz
Torpedo-placer....M. Coe et al
Toy....C. G. Hellstrom
Trace-holder....H. S. Geer
Track-sanding machine....T. L. Hamer
Traction-wheel....H. C. Cloyd
Train-arrester....F. C. Kuhne
Transmission mechanism....A. F. Glaser et al
Transportation system....W. C. Carr
Trichlorindigo and making same..G. Engi et al
Trolley-pole catcher....J. H. Walker
Trolley support, Aerial-....J. Bryan et al
Trolley-switch....B. G. Watkins
Trolley-wire hanger....J. Bryan et al
Trowel or float, Plasterer's....G. H. Bishop
Truck....R. W. Oswald
Truck, Car-....W. H. Miller
Truck, Liquid-spraying....G. T. Connor
Tunnel and subway....G. W. Jackson
Turbine....A. Piau
Turbine, Marine....T. G. E. Lindmark
Type setting and distributing machine....L. Roberts
Type-writing machine (2 pats.)....M. W. Pool
Type-writing machine....C. E. Smith
Type-writing machine....A. W. Steiger
Umbrella....J. A. Eberle
Universal joint....E. G. Hoffmann
Universal joint, Power-transmission....H. R. Shaw
Valve....L. L. Craddock et al
Valve, Automatic....A. B. Szperkowsky
Valve, Automatic relief-....A. Harison
Valve for engines, Steam-actuated, A. G. Stokes
Valve for rotary engines, Control-...E. Taylor
Valve recording and indicating device....H. C. Howard
Valves, Manufacturing air-chambers for relief-....H. Burner
Vehicle....C. R. Jesse et al
Vehicle running-gear....V. Zdziarski
Vehicle running-gear....A. L. Hamilton
Vehicle running-gear....J. S. Lewis
Vehicle safety-reflector....R. K. McLean et al
Vehicle-seat....H. C. Martell
Vehicle-spring....J. G. Nolen et al
Vehicle-top support....W. N. Hurt
Vehicle-wheel....W. D. McNaull
Vendig-machine, Coin-controlled....R. I Hill
Vessels, Guard for channeled marine..L. Dion
Vise....G. M. Yost
Waist and skirt holder, Adjustable....E. Czarnkowsky
Washing-machine....T. C. Sorensen
Washing-machine cylinder....C. Jensen
Watch....J. T. Pendlebury
Water-closet....N. B. Griffith
Water-cooling tower....O. M. Gould
Water-gage....S. Neutra
Waterways with falls, Hydraulic device for movable closing organs in....J. C. Nyholm
Wave-motor....W. G. J. Bentley et al
Wave-motor....R. Craig
Weighing apparatus....H. E. Morris
Welding-tool....A. Futterman
Wheel....W. H. Parham
Wheel....G. Wolke
Whiffletree attachment....J. Unger
Whip-lock....W. H. Heiliger
Whirligig....P. E. Smith
Windmill-gearing....M. Keys
Window, Iron-frame....A. Pachsher
Wire-making machine, Barb-..A. L. Kitselman
Wood-carving machine....W. J. Egan
Wood, Preserved (2 pats.)....P. C. Reilly
Wood, Vulcanizing....C. Howard
Wool-washing machinery, Squeeze-roll for....I. F. Burnham
Woven fabric....I. E. Palmer
Wrench....I. H. Alfrey
Wrench....J. Reif, Jr.

DESIGNS.

Badge....J. Sabin
Badge or similar article....A. W. Southard
Bird-cage....L. H. Johnson, Jr.
Cabinet....A. A. Low
Emblem, Campaign....E. J. Pospisil
Emblem or similar article....C. B. Braunstein
Glove....C. Leppert
Hat-fastener, Lady's....M. E. Purdy
Implement-holder....A. A. Low
Powder-container cap....F. S. Hyatt
Shade-holder....H. E. Watkins
Silverware-border....J. E. Straker, Jr.
Stove....E. B. Colby
Trimming....W. Helbig
Vehicle-seat....W. H. McIntrye

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MECHANICAL PATENTS.

Abrasive apparatus....O. C. Wysong
Acid, Making nitric....O. Bender
Acid, Making sulfuric....O. Bender
Adjustable bracket....D. G. Bradstock
Adjustable chair....C. H. Rhodes
Air-brake system....B. Aikman
Alarm....T. E. H. Buchanan
Antiseptic attachment for telephones....F. C. Tabler
Antiseptic mouthpiece for telephones, speaking tubes, &c....M. S. Hufschmidt
Asenious oxid, Manufacture of....U. Wedge
Axle-lubricator....J. Aden
Axle-spindle....T. L. Martin
Axles, Driving mechanism for swinging....A. H. Fetzer
Bag-frame lock....L. B. Prahar
Bag-holder....A. A. Smith
Bag-holding rack and twine-holder, Combined..J. B. Frear
Barrel-raiser....F. H. King et al
Barrel, Machine for use in chiming, crozing, and howelling....C. J. Alley
Basket....A. H. Crawford
Bath and stand for the same....R. H. Quine
Bathometer....P. Henze
Battery cover, Electric-....H. J. Brewer
Bearing, Ball- (2 pats.)....F. W. Witte
Bearing for self-closing liquid shut-offs, Roller-....A. Schuermann
Bearing, Roller-....J. A. Perkins
Bed....O. E. Enell
Bed, Folding....O. E. Enell
Beer-dispensing apparatus....S. J. Asbell
Belt-fastener....A. G. Tomkies
Bicycle package-carrier....G. W. Blake
Billiard-table, Convertible....H. F. Davenport
Blacking-machine....E. E. Taliaferro
Blast-furnace....J. H. Meissner
Blind guide and stop, Window-..W. W. Bruce
Block-signaling device..W. and A. H. Fechner
Block-signaling system....J. S. Holliday
Boat (2 pats.)....W. B. Motheral
Boiler-cleaner....F. X. Bayor
Boilers, Man-head crane for team-....S. Dillon et al
Bottle....G. Geisendorfer

Bottle-opener....A. A. Busch
Bottle or other vessel, stoppering....E. A. Matthias
Bottle-stopper....J. H. Smith
Bottle-washing machine....J. F. Haller
Box....G. B. Reed
Box-fastener....N. Dahl
Box-fastener, Spring-catch....G. Valentine
Bracelet-joint....W. Wallenthin
Brake-shoe (2 pats.)....C. S. Shallenberger
Brick-machine attachment....M. N., C. J., and A. H. Grant
Bridge-dam....H. L. Coburn
Building construction....P. H. Jackson
Bunching and counting machine....F. E. Strasburg
Bundle-tie....A. W. Baird
Burglar-alarm and window-sash, Combination....T. E. Cain
Button, Garment-....L. D. VanValkenburg
By-pass....E. Burhorn
Cabinet, Account-....J. S. Bash
Cabinet, Laundry-....W. P. Berry
Cake-mixer and egg-beater....A. J. Saltsman
Calendar....H. E. Shedd (Reissue.)
Calendar....H. Taylor
Calendar, Perpetual....A. W. Proctor
Camera-back, Circular....E. L. Hall
Camera-shutters, Magnetic operating means for....A. Bartels
Can-body-flanging machine....V. Odquist et al
Can-making machine....V. Odquist
Can-tester....E. V. Swangren
Cannon-pinion....W. F. Jost
Car-bolster....F. L. Irwin
Car, door, Grain-....A. J. Denton
Car, Dumping-....H. T. Herr
Car, Freight-....H. B. Houser
Car operating mechanism, Dumping-....S. J. Johnson
Car safety-guard....M. Meyer
Car-underframe construction, 2 pats....F. L. Irwin
Cars, Sash-window for railway-....R. Mende
Carbureter....F. H. Heitger
Carbureter....H. Small
Carpet-sweeper....L. P. Halladay
Cart....R. Weir
Cartridge-belt, 3 pats....W. C. Fisher
Cartridge-pocket, 3 pats....W. C. Fisher
Cartridge-shell-repairing machine....J. W. Haughawout
Casket-handle....J. H. Mills
Caster, Furniture 2 pats....G. E. Neuberth
Caster, Furniture....E. P. Rother
Catamenial appliance....D. S. Daudt
Catch for swing-closures....J. H. Nelson
Centrifugal block-machine....M. Nashold
Centrifugal machine....A. J. Ericsson
Chair....O. L. Ostendorf
Chair-bottom clip....J. P. Williams
Chair-canopy....T. Morton
Chairs, Reclining attachment for....F. E. Barnickle
Checkrein-hook....J. B. Rotz
Chemical product resembling celluloid and producing the same....F. Raschig
Chenille-spotting machine....L. O. Trivett et al
Chromium, Producing an electrolytic deposit of metallic....F. Salzer
Churn-dasher....L. A. Sprout
Cigar-box....A. B. Smith
Cigarettes, Production of shells employed in the manufacture of....I. Semenoff
Circuit-interrupter....C. B. Snell
Clock, Alarm-....R. Metz
Clocks and the like, Portable case for....W. H. Slattery
Cloeks and the like, Striking mechanism for....J. P. L. Lindstrom
Clocks, Program attachment for..J. W. Hansen
Clothes-guard....B. J. Simpson
Clothes-line holder....J. C. R. Steirly
Clutch....F. M. Nichols
Clutch, Friction-....P. M. H. Lange
Cock, Blow-off....G. H. Osman
Cock or valve, Water....B. H. Porter et al
Coffee-steeper....J. Steinberg
Coke-drawing apparatus....J. Reed
Collapsible frame or support....L. K. Sone
Colors, Process of fixing....H. Toepfer
Colors, Producing indulin...A. Ostrogovich et al
Column-step....J. Glover
Combination-lock....F. Soley
Composition....J. H. Batchelder
Compressor, Variable-capacity..B. V. Nordberg
Concentrating-table....A. M. Kemp et al
Concrete building-blocks, Machine for constructing hollow....J. Fish
Condenser and making same....M. K. McGrath. (Reissue.)
Controller....E. W. Stull
Controlling mechanism....H. Meyer
Conveyer....C. H. Knapp
Cooking utensil, Traveling....L. K. Sone
Copper matte, Bessemerizing...G. H. Benjamin
Corn-crib....J. W. Van Wyhe
Corn, Machine for removing silk from ears of....S. E. Morral et al
Cotton chopper and cultivator....T. T. Lecroy
Coupling mechanism....W. D. Leftwich
Cradle or rocker attachment....H. A. Jenson
Crate....C. S. Young
Crayon-holder....H. T. Bailey
Cross-arm support....J. M. Humiston
Cross-arm support....W. E. Callane
Cupboard, Folding camp-....I. B. Dodson
Cure of rheumatism and other diseases, Appliance for the....D. R. Dewey
Curling-iron heater, Electric....W. Meredith
Current motor, Alternating-....J. H. Bryson
Current rectifier, Electrolytic alternating-, 2 pats....A. S. Hickley
Curtain-pole....F. V. Donnelly
Cut-out mechanism, Progressive....J. H. Hall
Cutting apparatus....C. Klingenberg
Cutting, punching, and tire-shrinking machine....W. T. Sears
Cylinder-lock....C. J. Waugh et al
Damper-regulator....W. M. Fulton
Dancing-chart and method of self-instruction....G. Kolp
Dental appliance....E. E. Holmes
Diaper, Baby's....L. E. Irwin
Dispensing vessel....H. von Baeyer
Display-rack....E. B. Weston
Display-rack....M. Mayer
Display-rack attachment....E. B. Weston
Door-hanger....J. Doran
Door-holder....H. G. Voight
Doughnuts and the like, Apparatus for turning....W. H. Tomlinson
Draft attachment for vehicle-thills....T. H. Leonard
Dredge....J. C. Carter
Driving mechanism, Variable-speed....M. E. Vaughn
Ear-trumpet....K. F. Hackert
Ear-trumpet....B. S. Stephenson
Egg-tester....J. W. Burkholder
Electric furnace....R. McKnight
Electric furnace....J. H. Reid
Electric furnace....E. Cornelius
Electric generator....G. Honold
Electric switch, Remote-control....J. S. Bristol
Electrode for electrolytic purposes....P. Ferchland et al
Electromagnet for telegrahpones....P. O. Pederson et al
Electroplating apparatus....J. A. Yunck
Electroplating metal sheets, Apparatus for....H. L. Hollis
Electrosonator....R. Sakamoto
Elevated carrier, 2 pats....A. H. Neller et al
Elevating and lowering device, Universal....E. G. Gebauer
Elevator....S. V. Trent
Elevator safety device....J. N. Anderson
Elevator safety device....R. Bohlen
Elevator safety mechanism....P. F. Foley
Engine....H. L. Ide
Engine....M. E. Keller
Engine starter, Gas-....R. W. Godfrey
Engines and motors, Alarm or signal system for....W. S. Rush
Engines, Belt-holder for....E. Hicks et al
Engraver's spoonholder....F. W. Crocker
Envelope....E. Kohler
Eraser, Ink-....J. C. Huss
Excavating-machine....W. M. Brown
Explosion-engine....A. W. Cottrell et al
Extinguishing device....F. Hursthouse
Eyeglasses and spectacles, Converting device for....F. K. Stickle
Fabrics, Machine for unraveling textile....P. F. Vogel
Fan....E. Goosch
Fastener, Metallic....G. W. McGill
Faucet....L. S. De Forest
Faucet....J. G. Kasjens
Feed-trough....C. B. Haldeman
Fence fastener, Wire-....J. H. Knickerbocker
Fence-making machine, Wire-....J. M. Denning
Fence-stay-fastening machine, Wire-..Z. Hurd
Fender-clip....W. C. Groehn
Fertilizer-distributer....L. E. Roby et al
Fiber-preparing machine....A. Zabriskie
Fiber stripping and cleaning machine....S. O. Dickinson
File-cabinet....C. G. Ward
Filter-press....C. W. Merrill
Filter, Pressure-....P. E. Maggini
Filter Pressure....C. W. Merrill
Filter, Rain-water....L. W. French
Fire-alarm, Electric....H. Anderson
Fire-doors, etc., Ventilator for....A. H. Lowry
Fire-extinguisher, Destructible link or automatic....J. D. Farr
Fire-extinguishing apparatus....J. G. Robinson et al
Fire-protective shield....D. S. Watson
Fishing device....J. B. Welch et al
Fishing-reel....G. E. Matts
Fixing and washing tank....G. H. Scheer
Floor-cramp....F. Williams
Flue-dust and fines, Recovering values from....R. Baggaley
Flue-dust, Composition for solidifying....S. W. Ramsey et al
Flue-plugger....W. B. Wingate
Fluid-joint, Flexible....C. G. Hawley
Flue-joint, Flexible....E. E. Silk
Fluid-pressure regulator....L. B. Fulton
Fluid-receptacle, Portable....L. Kessler
Folding box....J. M. Johnson
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Folding table....O. C. Kade
Fuel Manufacture of artificial..A. W. H. Vivian
Furnace....W. A. Garvens
Furnace-feeding mechanism....F. Kingsley
Furniture-slat....F. P. Grode
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Garment-fastener....E. B. Stimpson
Garment-hanger....N. E. Miles
Garment-supporter....C. W. Wallis
Gas-engine....C. A. Clark
Gas-generator....C. I. Tenney
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Gas-making systems, Boiler for..C. I. Tenney
Gas-manufacturing apparatus....E. Rider
Gas-manufacturing apparatus....H. Pettibone
Gas-manufacturing apparatus, Hydrogen-....E. Geisenberger
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Gearing....W. J. Wilde
Glassware, Method and apparatus for making....W. E. Holmes
Gluing-frame....A. Hettel
Grader, Road-....E. A. Hollenbeck
Grain-shocking machine....W. A. Leitch
Grinder for wood-planer knives....W. H. Kable et al
Gum, Production of a soluble....F. Fritsche
Gyrator....J. M. Schutz
Hair-drying device....G. Siegfried
Harrow....J. D. McMillan
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Hat sweat-shield....H. W. Wagenet
Hay-press....G. A. Rapp
Hay-press, Multiple....J. H. Means
Hay rake and elevator, Combined..C. H. Knapp
Headlight-controller....H. R. Parker
Heat from one medium to another, Apparatus for transmitting....E. Morterud
Heating device, Electric....W. C. Mortensen
Heating systems, Vacuum-generating apparatus for steam-....W. E. Tillinghast
Heel-nailing machine....E. A. Webster
Hide-working machine....R. F. Whitney
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Hinge for water-closet seats, covers, and the like, Post-....G. A. Geary
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Hoisting-machine....J. J. Say
Honey, Extracting....W. Avant
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Hook and eye....J. P. Baumgartner
Hopper-bottom catch....J. W. Egan
Horse-detacher....J. R. Claxton
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Hydrocarbon-burner....V. W. Blanchard et al
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Ice-cream freezer attachment....O. R. Briggs
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Loom stop-motion mechanism....G. McCartney
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Lubricator....W. C. Maness
Lubricator....L. R. Hoffman
Mail-delivering device....G. M.Beard
Masage-vibrator....W. G. Shelton
Match, Friction-....H. W. Whelan
Mattress....F. A. Kaiser
Measuring apparatus for indicating depths....H. H. Brown
Measuring device, Skirt-....N. E. Miles
Meauring instrument, Lens-....F. Hardinge
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Metal-shaping apparatus, Heated-..F. J. Loomis
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Motor controlling system, Electric-....B. G. Lamme
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Oven-door....W. A. Moore
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Package for vaccine or virus, Aseptic....C. H. Higgins
Packing....A. F. Book
Paper-bag machine....C. F. Smith
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Paper bucket or box....B. B. McFadden
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Pressing hollow bodies having depressions or cavities at their outer sides, Means for....C. Geffers
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Pump-primer....J. J. Bataille
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Punch-ball machine, Coin-freed..A. C. Savage
Quilling-machine....B. Eastwood, Jr., et al
Rail-bond....A. W. McConnell
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Railway-track-rail-drilling machine..F. Marsellis
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Reinforcing-bar....A. C. R. Janni
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Ruling machines, Diagonal-ruling attachment for paper....J. E. Foster
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Saw mill, Twin band-....A. Mereen et al
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Sole-leveling machine....E. E. Winkley
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Sound recording and reproducing instrument....G. Kirkegaard
Speed transmission mechanism, Variable-....A. Latham
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Spike-lock....A. Smith
Spinning or twisting apparatus..A. E. Rhoades
Spool-case....C. J. Alfred
Stair-rod....A. Davis
Stand-pipe....F. N. Whitesell
Steam-service controlling and recording apparatus....G. M. Hilger
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Stevedore-rig....J. Knuppel
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Wall-tie.....J. H. Jackson
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Water-cooler.....E. Mohr
Water into mine-workings, &c., Stopping or sealing off underground flows of.....E. B. Kirby
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Window-lock.....C. C. Higgins
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Wire-stretcher.....A. W. Templeton
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Badge.....M. A. Hudson
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Bottle-molding means, Hot-water-.....T. M. Gregory
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Cement and making the same, Slag....H. Kühl
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Chair.....A. G. Eyles
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Chuck-operating means.....J. Jecklin et al
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Clip-hook.....H. Johnson
Clock attachment.....E. A. Hummel
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Display-holder.....F. N. Look
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Door-closer, Automatic.....S. Remontet
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Draft-evener.....H. and J. H. Thiedemann
Draw-bar-centering device.....F. S. Gallagher
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Drinking-fount for live stock.....H. B. Talley
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Dust-pan.....L. J. Chapman
Dyeing, washing, and stripping machine, 2 pats.....H. Hennig
Egg opener and holder, Hot-..J. H. Bancroft
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Electric coils and conductors therefor, Producing.....I. Kitsee
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Electric machine, Dynamo-, 2 pats..H. G. Reist
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Electric switch, Quick-break....H. H. Howard
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Ether, Making chloracetic.....G. Imbert
Excavator, Endless-chain bucket...G. L. Hurst
Eyeleting-machine, Hand-operating.....J. L. Knight
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Farm-gate.....A. G. Eddy et al
Fastener.....W. E. Smith
Faucet.....C. E. Coe
Feed-water heater.....J. H. Kidwell
Feeding apparatus.....C. T. Hatch
Fence stretcher, Wire-.....J. H. Gwynne
Ferrule, Handle-.....J. H. Bennett
Fertilizer-distributer.....J. C. and W. J. Pope
Filler-can, Safety.....W. H. McNutt
Fire-alarm trip, Automatic.....F. A. Kehl et al
Fire-boxes, Device for creating a central draft for.....G. F. Pannebaker
Fire-extinguishing apparatus, Automatic.....J. D. Farr
Firearm, Automatic magazine-....C. W. Louis
Firing of self-loading arms, Device for automatic.....S. H. Bang
Fishing-reel.....B. A. Flynn et al
Fluid motor, Elastic-.....V. Pingret
Fluid-pressure conduits, Coupling for.....P. Furtner
Fluid-pressure distributer.....J. B. Tuor
Flushing-head.....T. M. Murphy
Flying-machine.....A. H. Friedel
Folding and adjusting chair...T. F. Rohinson
Folding box.....J. G. Reber
Folding stand.....J. F. Van Horn
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Footwear-cushion.....B. N. B. Miller
Fruit-sizer.....R. P. Redmond
Fur-hlowing machines, Riddle for.....H. B. Fanton
Furnace.....H. A. Poppenhusen et al
Furniture.....F. N. Churchill
Fuse, Safety-.....F. D. Reynolds et al
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Game apparatus.....A. A. Storey
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Garment-supporter.....C. B. Harris
Garments, Overlapping the edges of...L. Ring
Gas-cut-off device, Thermal....A. C. Schwager
Gas-furnace.....L. G. Fromont
Gas-generator.....H. Rehmann
Gas-heaters, Deodorizing attachment for.....H. A. Gorsline et al
Gas-holders, Guide-frame for....H. J. Stoffels
Gas-meter, Coin-controlled.....H. T. Sloper
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Gas, Producing-.....B. E. Eldred
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Gearing.....T. B. Jeffery
Gearing.....H. C. Clay
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Glass articles, such as bottles, Apparatus for manufacturing hollow.....H. Severin
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Iron from tin-plate scrap, Preparing merchantable.....E. A. Sperry
Jacquard mechanism.....M. A. Perrin
Jar-wrench.....K. Lyons
Jars, Depressor for fruit-.....N. K. Keeley
Journal-bearing.....E. R. Bailey
Knitted fabric and making same...R. W. Scott
Labeling-machine.....F. O. Woodland
Lacing-hook-making machine.....H. H. Eaton et al
Lacing-hook-setting machine.....S. E. Taft
Lamp adjustahle support, Vapor-, 2 pats.....S. E. Flichtner
Lamp, Arc-.....J. A. Dalzell et al
Lamp, Arc-.....R. Fleming et al
Lamp, Arc-.....G. E. Stevens
Lamp bracket, Signal-.....F. W. Edmunds
Lamp-hurner.....C. E. Wirth
Lamp, &c., Electric glow-.....F. Blau et al
Lamp, Gas-.....R. W. Zierleit
Lamp holder, Switch-.....F. W. Edmunds
Lamp, Vapor-burner.....R. W. Jorres
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Lathe-dog.....D. R. McKim
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Liquid-purifying apparatus, Electrolytic.....J. T. Harris
Liquid-separator, Centrifugal.....G. J. Bragg
Liquids, Machine for separating solids from...F. K. and E. F. Atkins
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Locomotive-mover.....J. F. Cameron
Log-grab.....D. W. Murphy
Loom-harness, Brushing-machine for...M. Fish
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Lubricating device for shafts, &c.....H. C. Gamage
Magnesia, Preparing concentrated hydrated...W. S. Morrison
Magnesium by electrolysis, Production of.....G. O. Seward et al
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Mail-bags from a moving train to a station, Apparatus for transferring.....N. F. Valentine
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Metallic fabric.....C. E. Bedient
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Mica-splitting machine.....B. Walchner
Mine-trackage system.....F. R. Willson, Jr.
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Mold.....W. N. Wayman
Mold-fastening device.....J. H. Sullivan
Molding devices, Riser-lining for.....E. C. Washburn
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Motors, Platform for power-.....A. Nacke
Music-roll and apparatus to be used in connection therewith.....H. P. Ball
Musical instruments, Pneumatic action for...J. P. Caulfield
Musical instruments, Pneumatic action for....M. S. Wright
Nailing-machines, Automatic nailing device for.....C. Sattler

(Continued in December Number.)

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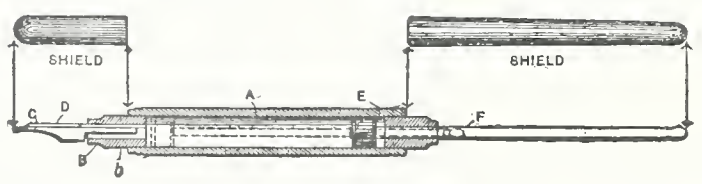
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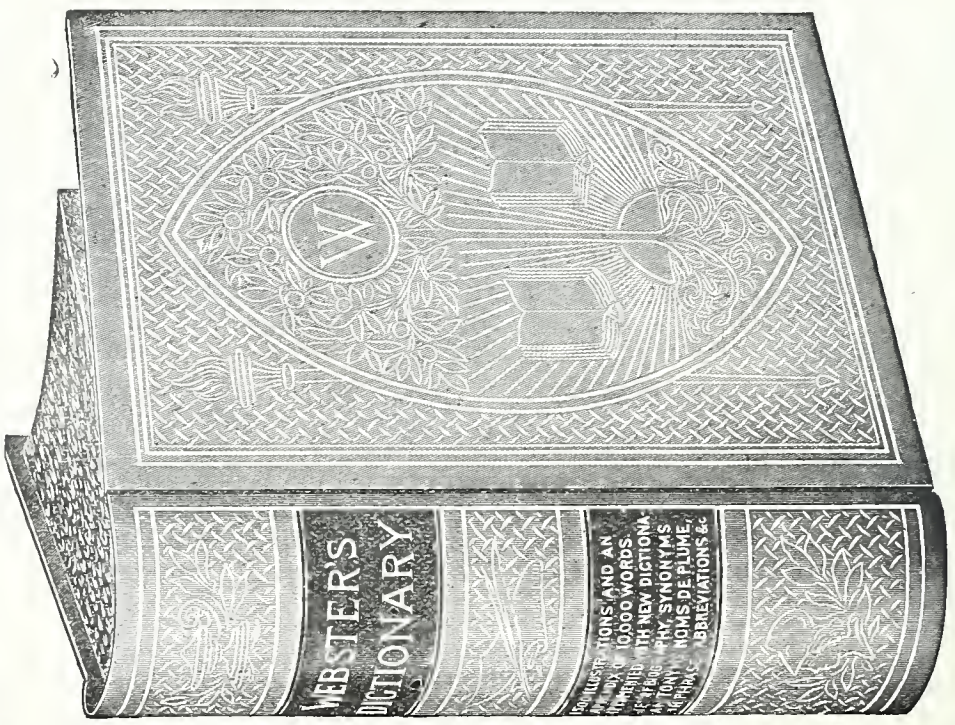


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SUCTION GAS PRODUCER POWER.

AMERICAN PRODUCERS FOR AMERICAN COALS AND LIGNITES.

By L. P. TOLMAN.

PROBABLY no invention has ever come into public favor in so short a time as the Suction Gas Producer. Introduced into the United States about five years ago, this system of developing power from coal and lignite has already become a commercial reality and is fast gaining approval among engineers and power users.

The early history of producer gas dates as far back as the year 1509, at about which time the "Fulen Heitzen" first became known, and were described by H. Brunschwyk, in his book "Ars Distillandi de Compositis," or "The Art of Distilling Compounds," which was published in Strasburg, Germany.

The first plant similar to those now in use was built by Mr. Emerson Dowson, who has the distinction of introducing, in England, in 1878, the first practical gas producer for power. This was of the "pressure" type. A small steam boiler was necessary, as well as a large gas holder. Mr. Dowson's plants were successful and are still in regular service. Anthracite is the usual fuel.

The next substantial progressive step was taken when Dr. Ludwig Mond, in England, in 1889, developed the first successful soft coal producer. This became a standard for sizes of 250 horse power and larger, but proved too elaborate and expensive for use in smaller sizes. With this plant a large gas holder is needed, also a steam boiler and an elaborate system of gas washers, purifiers, and economizers.

Then followed the invention of Herr C. Wiegand of Hanover, Germany, who in 1895 took out the first patent (No. 88044, German) on the principle of the modern suction gas producer. The importance of this invention was not realized in Germany until some years later.

In France, during the same year, Benier built what is believed to be the first practical suction gas producer. This was a success as soon as the necessary changes had been made in the gas engine to adapt it to the "suction" system. It is surprising in this case, as with most other great inventions now in general use, that an apparatus so simple and easily understood was not developed long before.

About five years ago American manufacturers began to take a live interest in the success of European, and especially German, suction gas power plants. American engineers visited Europe and in this way learned at first hand what was being done abroad. As early as the year 1904, it is estimated that there were over 10,000 suction gas power plants in Germany alone. They had come into general use and were found in the finest hotels, stores, factories, etc., for electric lighting and other power purposes. The actual users of the plants were enthusiastic over the results.

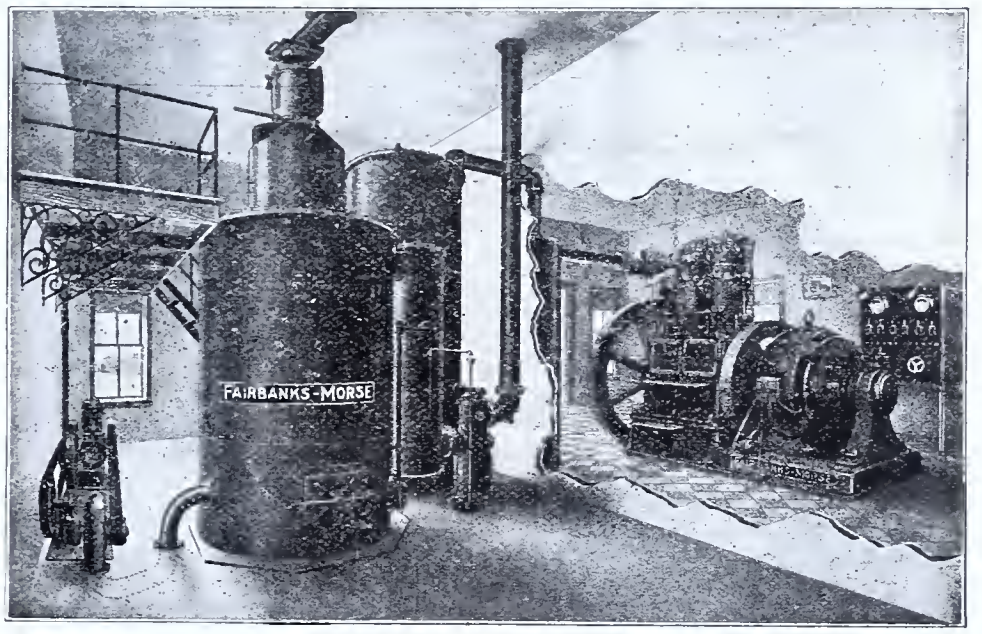


FIG. 1.—A COMPLETE PRODUCER GAS POWER PLANT WITH ENGINE CONNECTED DIRECTLY TO ELECTRIC GENERATOR.

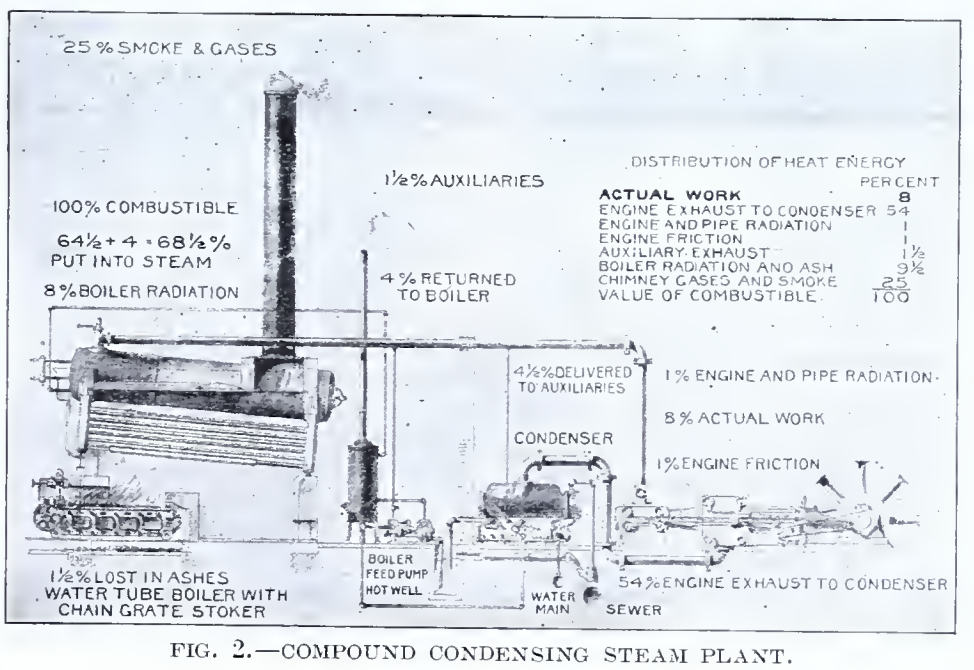


FIG. 2.—COMPOUND CONDENSING STEAM PLANT.

That producer gas power is a pronounced success in the United States is evidenced by the large number of satisfactory installations already in operation on American coals. It is estimated that there are over 500 producer power plants in this country, having an aggregate of 150,000 horse power. Of these, about eighty-five per cent are of the "suction" type and fifteen per cent of the "pressure" type. The suction plants average approximately 100 horse power each, while pressure plants are usually built in sizes larger than 1000 horse power.

This article deals with suction gas power plants in single units of 200 horse power, or smaller, and complete plants made up of a number of such units of 1000 horse power, or larger. This range of sizes covers the requirements of the great majority of power users.

COMPARATIVE WASTE WITH STEAM AND PRODUCER GAS POWER.

This idea is illustrated graphically. Fig. 2 illustrates a modern steam plant with its many complications, including compound condensing steam engine with water tube boiler. This plant converts 8 per cent of the total energy of the fuel into useful work. (In actual practice the percentage utilized is usually less.) In other words, 92 per cent or more of the energy in the coal goes to waste as smoke up the chimney, exhaust from the engine, heat radiation, etc.

A 150 horse power steam plant of this type, running at two-thirds load, 3100 hours per year, uses approxi-

mately 4½ pounds coal per brake horse power per hour. With coal at $2.75 per ton, the fuel alone costs $1,918.12 per year. In addition, the cost of attendance is a large item of expense, and the boiler, especially, calls for constant attention, cleaning, and repairs.

Fig. 3 illustrates the ordinary throttling governor steam engine with tubular boiler, a type which is in very general use, especially in sizes from 15 to 200 horse power. This plant converts five per cent (though usually much less) of the total energy

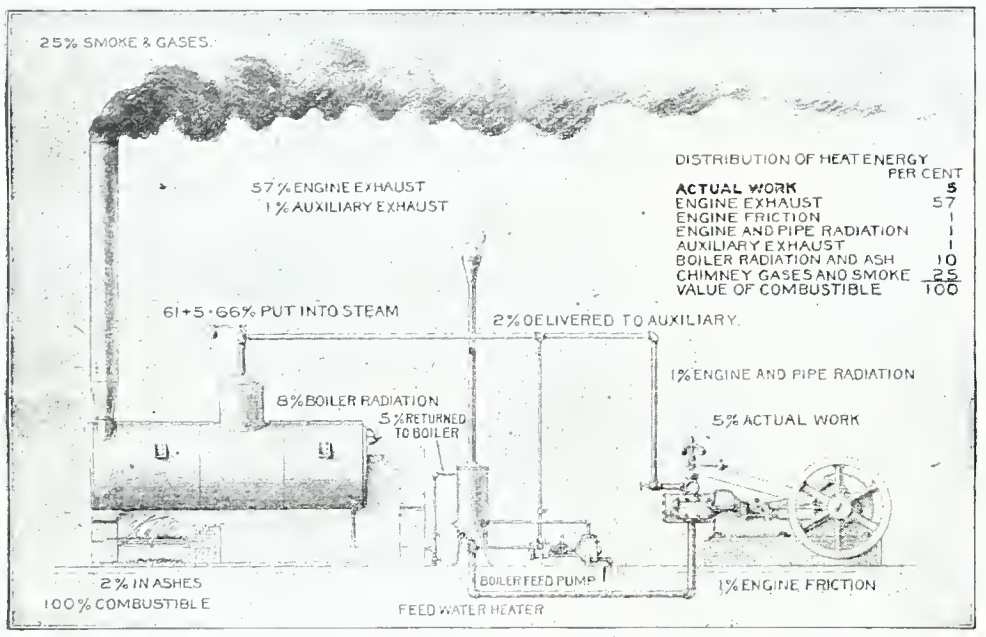


FIG. 3.—SIMPLE STEAM ENGINE AND TUBULAR BOILER.

of the fuel into useful work. In small steam plants the total amount of energy utilized is often not over two or three per cent. In other words, 95 per cent or more of the energy in the coal goes to waste as smoke up the chimney, exhaust from the engine, heat radiation, etc.

A 150 horse power steam plant of this type, running at two-thirds load,

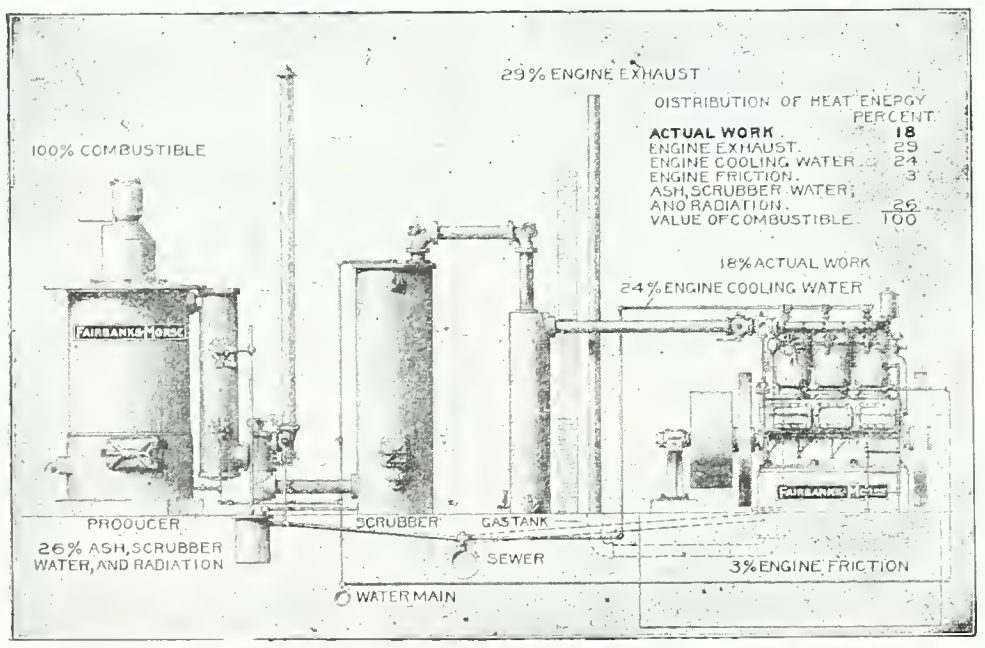


FIG. 4.—SUCTION GAS PRODUCER POWER PLANT.

3100 hours per year, uses approximately 7 pounds of coal per brake horse power per hour. With coal at $2.75 per ton, the fuel alone costs $2,983.75 per year. In addition, it requires the entire time of at least one man to operate the plant. The boiler, especially, requires constant care, cleaning and repairs, and is always a source of danger.

Figs. 1 and 4 illustrate a suction gas producer power plant. The apparatus is simple, reliable, and amazingly economical. With this plant 18 per cent of the total energy of the fuel is converted into useful work. (Varies according to conditions from fifteen to twenty-one and one-half per cent.) This means that a suction gas producer plant uses from one-half to one-fourth as much coal for a given amount of power as a steam plant.

A 150 horse power suction producer plant, running two-thirds load, 3100 hours per year, uses approximately one and one-half pounds of coal per brake horse power per hour. (Tests have been made showing a consumption of less than one and one-quarter pounds at two-thirds load, and less than one pound at full load.) With anthracite at $5.00 per ton, the fuel alone costs $1.162.50 per year. Furthermore, the cost of attendance can be reduced materially with a producer plant, as the operator can spend part of his time in other useful work.

GOVERNMENT TESTS.

Much valuable information is given in the report of the United States Geological Survey concerning the fuel testing plant at the Louisiana Purchase Exposition, St. Louis, Mo. For three years the government experts conducted a series of tests on many samples of coal from mines all over the country. Briefly, the apparatus included a non-condensing Corliss engine steam plant with water tube boiler and a pressure type producer with three-cylinder vertical gas engine.

From the summary of results obtained from a long series of tests, the fuel consumption in the pressure type producer plant varied from 1.18 to 3.47 pounds per brake horse power per hour, the average being approximately 1¾ pounds. The average with the Corliss steam plant was found to be approximately 4½ pounds, using similar fuels. With lignite, the consumption in the pressure producer plant was from 1.95 to 3.47 pounds, the average of five samples actually figuring 2.60 pounds. With Corliss steam plant using lignite, the average consumption of "coal as fired" (not "dry coal") was approximately seven pounds.

While most of the above tests were on bituminous coals, which cannot be used advantageously in a suction producer, yet the consumption of anthracite in the latter is usually less than as stated for bituminous coal in the pressure type producer, probably due to the fact that there is less resistance to the flow of gas in the suction type. For example, tests on lignite in a suction producer commonly show a consumption of 2 to 2¼ pounds, whereas from the five lignite tests at St. Louis the average is 2.60 pounds in a pressure producer plant.

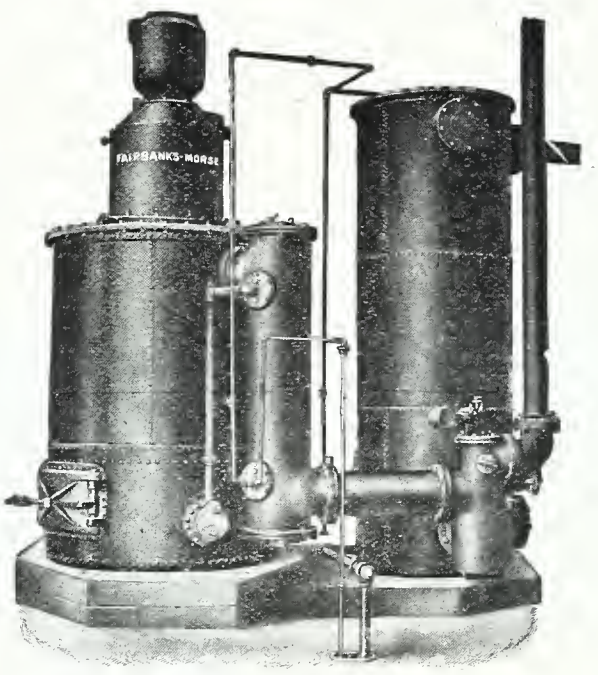


FIG. 5.—FAIRBANKS-MORSE SUCTION GAS PRODUCER.

ADVANTAGES OF SUCTION GAS PRODUCER POWER.

We have already discussed the high thermal efficiency of the suction gas producer plant. The most important and the most practical commercial advantage is the economy effected in the cost of developing power. If there were no other advantages, this one feature would be sufficient reason for installing this system. Other advantages may be summed up briefly:

Simplicity.—The producer, in which fuel gas is generated from coal, is almost as simple as an ordinary furnace for heating purposes. The gas engine is entirely automatic in operation and needs little more than the ordinary cleaning and care as to lubrication.

Absolute Safety.—There is no danger from explosion or from fire. It is absolutely safe, even in the hands of men with little mechanical training, and the many plants which are in continuous operation, some of them twenty and even twenty-four hours a day, indicate that they are thoroughly reliable and will stand hard, everyday usage. Boiler insurance is unnecessary with producer plants, and the troubles and dangers encountered with steam boilers are entirely avoided. The complete gas engine and suction producer plant is almostentirely automaticin operation, very little attention being required. Ordinarily the operator only needs to spend ten to fifteen minutes about every two hours, to dump a few buckets of coal into the producer and give general attention to the plant. He can spend part of his time in other useful work, and an extra man as fireman is not required, even with plants from 400 to 500 horse power.

No smoke stacks and no smoke.—Hundreds of thousands of dollars which are now spent annually in building smoke stacks can be saved; and what is of greater importance, the smoke nuisance can be entirely abated. The value of this feature can hardly be over-estimated, and such an ideal condition seems almost incredible to those who are not familiar with the subject.

Less coal to be handled and stored.—Where the suction gas producer plant uses 1¼ or 1½ pounds of coal, the steam plant commonly requires 4 to 6 pounds or more. Moreover, with the producer plant there are fewer ashes to be handled and disposed of.

Starting.—The producer will hold fire all night or even for several days, and the proper quality of gas can be generated after fifteen or twenty minutes' blowing to revive the fire. The engine can easily be started on compressed air, and after getting up to speed it is then operated on producer gas.

Stand-over loss.—The stand-over loss with suction producer amounts to about one-third as much as with a steam boiler. In other words, where the stand-over loss with a steam plant for fourteen hours amounts to 600 to 800 pounds, or more, with a suction producer plant of the same horse power this loss would not exceed 200 pounds.

SUCTION GAS PRODUCERS.

Fig. 5 illustrates an exterior view and Fig. 6 a sectional view of a Fairbanks-Morse Anthracite Suction Gas Producer. All of the principal features are clearly shown. Coal is admitted to the producer through a hopper at the top. This has double closure, so that fuel can be introduced without at the same time admitting air. In the process of partial combustion, which takes place, producer gas is generated.

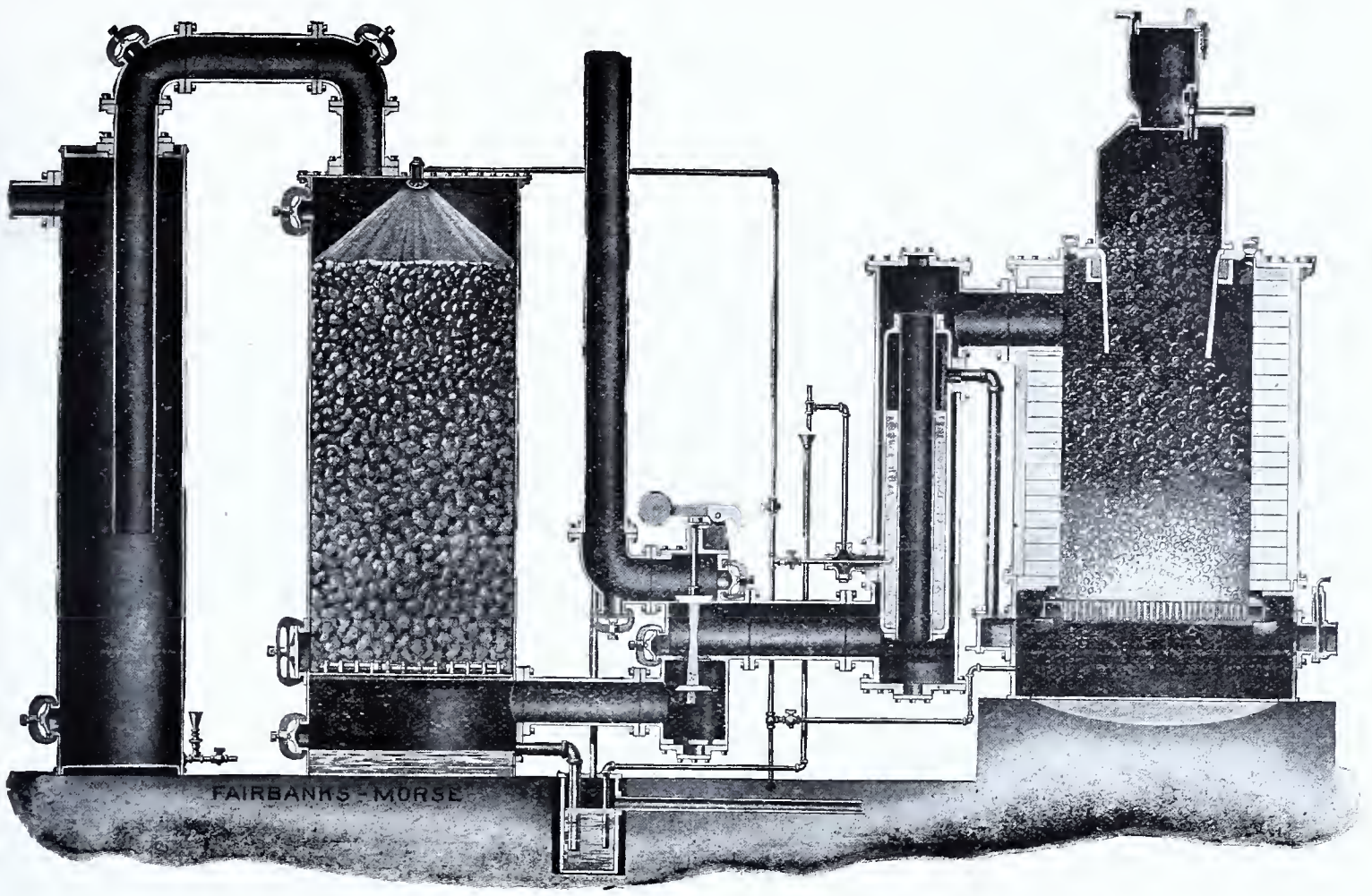


FIG. 6.—SECTIONAL VIEW OF FAIRBANKS-MORSE SUCTION GAS PRODUCER.

The hot gas passes through a vaporizer in which a small amount of steam is formed which, with a limited amount of air, passes under the grate of the producer. In the smaller sizes, the vaporizer is at the top of the producer where it uses the waste heat from the escaping gas, and where, at the same time, the water keeps the top from getting too hot. In the larger sizes the vaporizer is separate and connected to the producer by piping.

From the vaporizer, the hot gas flows through the scrubber, which is merely a cylindrical-shaped tank filled with coke, over which a spray of water is constantly sprinkled. The large contact surface of the coke effectually cleanses the gas of dust and impurities carried over from the producer, and also acts to cool the gas, which is essential in order to prepare it for use in the engine.

With certain fuels, especially when much tar is encountered, it is also necessary to add a sawdust purifier in order to abstract the last traces of tar from the gas. While not absolutely essential, yet it is always advisable to use a gas tank between the scrubber and the engine, in wbich a certain amount of gas is stored in ready use for the engine. This is especially desirable where the loads are variable.

In the care of the producer, the principal attention needed is to poke the fire every few hours, according to quality of the coal, in order to break up and remove clinkers, which would otherwise interfere with the making of sufficient gas. Poke holes are provided so that every part of the fire can be reached conveniently.

FUELS.

Anthracite in "buckwheat" or "pea" sizes, lignite, coke, and charcoal are the fuels commonly used. In many sections these small sizes of anthracite can be bought cheaply in car lots. For example, in Cbicago the car-load price of "buckwheat" antbracite is usually about $3.75 per ton. In some of the states west of Chicago the price varies from $5.00 to $7.00 per ton. At some points in southern Canada these small sizes of Pennsylvania anthracite can be bought for from $3.00 to $4.00 per ton. In some of the eastern states, wbich are nearer the source of supply, the prices are even less.

The lignite producer offers a wonderfully cbeap and reliable power in sections where this fuel is available. There are enormous deposits of lignite in Texas, Arkansas, Louisiana, Nortb Dakota, Montana, Wyoming, Colorado, and other western states- This can usually be had at a price of from $1.00 to $3.00 per ton. At Smithville, Texas, where a 150 horse power lignite producer plant is installed, the cost is $1.70 per ton. Lignite is of little value for steaming purposes, mostly due to tbe large amount of moisture, but it makes a most excellent fuel for tbe producer and in some respects is easier to handle than anthracite.

Coke and charcoal are economical fuels in some sections and can be used separately or mixed with anthracite.

PRODUCER GAS ENGINES—VERTICAL TYPE.

These engines are made in sizes of 200 horse power and smaller. By combining several units, plants of 800 to 1,000 horse power or larger have been installed. Fig. 7 illustrates a thorougbly modern Fairbanks Morse engine of this type. It may be of interest to engineers to note briefly a few of the carefully developed features in the design of these engines:

The present system of ignition is a great improvement over the methods formerly used. The make-and-break igniter is so constructed that it can be adjusted to spark as early or as late as desired, when engine is running or at rest, by means of a convenient hand lever. A single lever controls the time of ignition for all cylinders. This is a feature of much importance, especially with producer gas, as it permits timing the ignition to give the greatest possible power and economy with any particular grade of gas, and when the engine is running. In addition, there is an independent adjustment for each igniter wbich is operated by a drop cam.

Igniters can be removed, inspected, and cleaned, without interfering with other working parts, and they are located most conveniently. As the successful operation of a gas engine de-

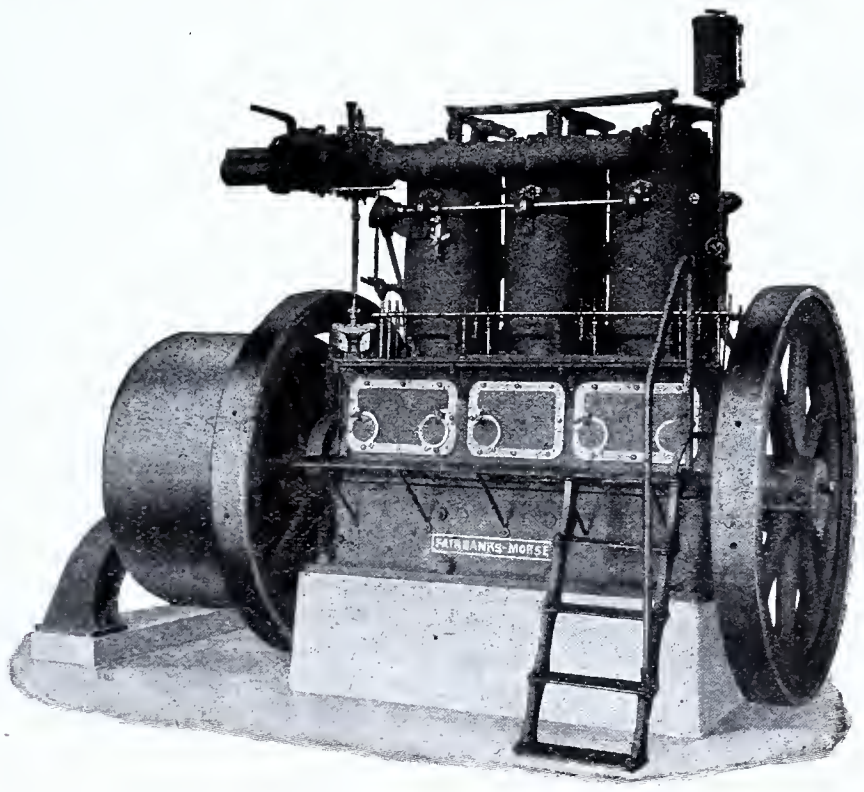


FIG. 7.—MULTI-CYLINDER VERTICAL PRODUCER GAS ENGINE.

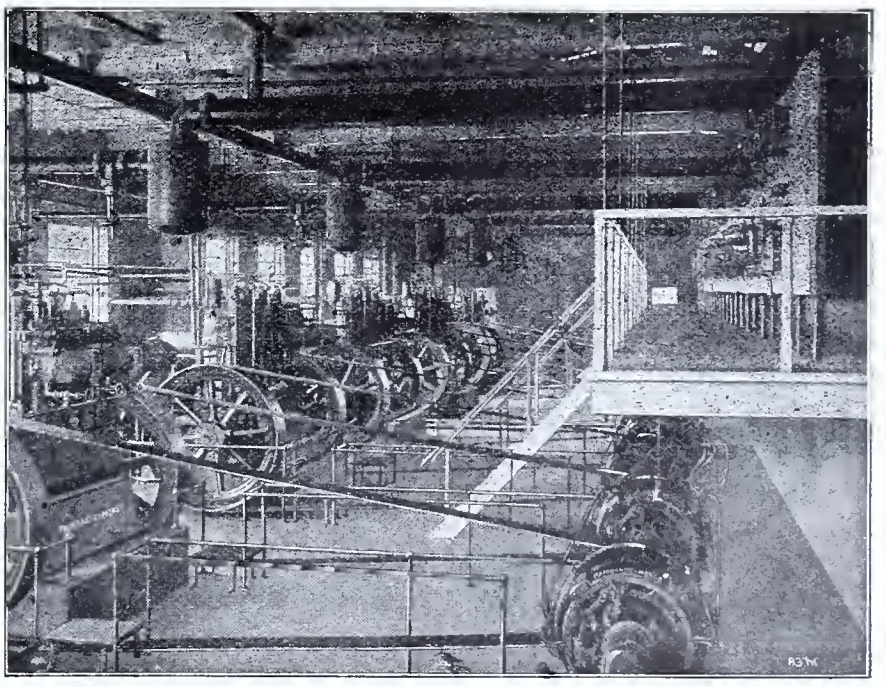


FIG. 8.—A 1100 HORSE POWER SUCTION GAS PRODUCER POWER PLANT.

pends largely upon the igniter, the value of these features cannot be emphasized too strongly.

Both valves are mechanically operated from a single cam shaft, which is located inside the crank case. This minimizes the amount of noise, and furthermore the two-to-one reduction of gearing includes the pinion, which is made of alternate layers of steel and red fibre. These features insure a quiet running engine.

The simple fly-ball governor is of a most carefully designed pattern. This operates a balanced disk valve which is so constructed that there is no frictional contact or surface to become fouled by any impurities in the gas. This is especially important with engines operating on producer gas. The governor insures very close regulation, adapting the engine for electric lighting and other service requiring uniform movement.

Lubrication is effected by means of a single elevated oil reservoir, which is provided with separate brass pipe with individual sight feed for each bearing. This is a most effective system of engine lubrication and has been adopted as the best to be had. The drip from the different bearings collects in the base of the engine, which is drained by means of a small pump. The oil is run through a filter and is then used over again.

One of the largest suction gas producer plants in the United States is illustrated in Fig. 8. This plant comprises six 150 horse power engines and one 200 horse power engine—1100 horse power in all—complete with suction gas producers, using anthracite as fuel. This plant is in Wisconsin, and is operated twenty to twenty-four hours each day, excepting Sundays and holidays.

There was previously in use in these works a Corliss steam plant, run non-condensing, with water tube boilers using Illinois soft coal as fuel. While it is difficult to make accurate comparisons as regards fuel consumption, yet as a matter of general interest it may be stated that the steam plant required approximately three and two-thirds times as much coal per unit of power developed as the present producer gas power plant.

The remarkable economy, together with the numerous other advantages mentioned briefly in the foregoing, have created a large and steadily growing demand for this form of power equipment. This fact and the surprisingly large number of installation already in successful operation on American coals indicate that a new industry has been created in this country.

Power users and engineers will welcome suction gas producer power as the logical solution of many of their power problems, especially in sections where local fuel costs are favorable. Indeed, when the actual merits of the subject are considered, it is not unreasonable to predict that the demand for producer gas installations may soon exceed even the most optimistic hopes of the manufacturers.

AN ELECTRIC MAGIC BOX.

By FRANK C. PERKINS.

Illusions, mysteries, tricks of magic, are attractive to old and young, and the wonder-working box here illustrated affords many opportunities for amusement. In this apparatus an aquarium, empty at one moment, is in the next instant seen swarming with live gold fish. A vacant cage viewed through the opening in the box suddenly has a handsome canary bird singing and in full view, or an empty cigar box is filled with cigars before the observer's eyes.

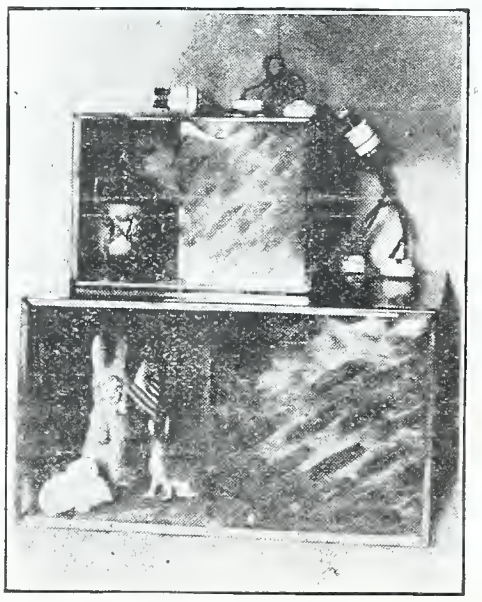


FIG. 1.

These optical illusions have often been produced in different ways and on a larger scale at theatrical performances by slight of hand performers; but this unique electrical device has been so arranged that any boy or girl may produce the novel effects in the family parlor, or a merchant may utilize it as a store window attraction for displaying goods in a startling manner. The details of construction showing how these illusions may be produced are given below.

The electric boxes are of oxydized copper finish, so constructed as to be readily assembled for parlor use, or dismembered and stacked compactly for storing or shipment. The upper box (Fig. 1) is about twelve inches square and eight and a half inches high, for parlor magic, and the lower box is eighteen inches square and ten and a half inches high, for use in window displays or at entertainments.

The sections of the casing are constructed of sheet metal and are detachably connected by providing the edges of the top and bottom sections with locking channels or grooves, which are adapted to receive hook-shaped tongues or flanges at the upper and lower edges of the rear side and front wall sections. The vertical corners are made tight by means of flanges arranged on the corner edges of the wall sections and overlapping each other. The front wall is made in one piece, but the rear and side walls are each constructed in two normally overlapping pieces, to permit of opening the casing at the right side adjacent to the front right corner, and at the rear side adjacent to the rear left corner. Within the casing is a partition, (Fig. 2) extending from the front left corner to the right rear corner, and dividing the box into front and rear compartments. The left half of the partition opposite the sight opening of the casing is transparent, and the right half opposite the front wall section is opaque. The transparent part of the partition consists of glass and the opaque part of sheet metal, the two parts being joined by a vertical groove formed on the left edge of the opaque section and receiving the inner opposing edge of the glass partition. The interior of the casing and also the opaque part of the partition are non-reflecting, being made of dark dull material, such as charcoal iron, or by a dark oxydized copper finish to prevent reflection of light.

Where electric current is not available for operating this device, candles may be used. It will be noted that adjacent to the rear end of the partition the right wall has an opening and the rear wall also has an opening, which lead from the exterior into the front and rear compartments, respectively, and permit the insertion of a match, taper or other light into these

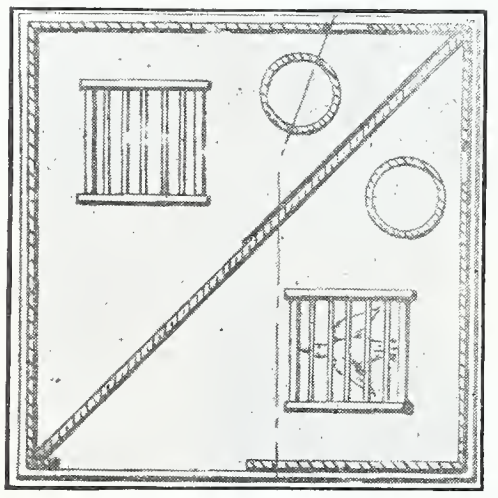


FIG. 2.

compartments, thus obviating the necessity of electric lamps, thermostat and connections, which are more expensive but produce the best results. For operating the magic box by electricity, the top of the casing is provided adjacent to the right or rear end of the partition with two openings which lead into the front and rear compartments. Detachably secured in these upper openings and arranged in the front and rear compartments, respectively, are two incandescent electric lamps.

When an object is placed in one or the other of the compartments within range of the glass part of the partition, and the compartments are alternately illuminated, an observer looking into the casing through the sight opening will believe that the object is appearing and disappearing. During the time the rear compartment only is illuminated, any object arranged within the same in rear of the glass part of the partition is visible to the spectator, but when the front compartment only is illuminated and the rear compartment is dark, any article in rear of the glass partition is obscured and any article in the front compartment is reflected by the front side of the glass partition in the line of vision of the spectator, and is made to appear as if located behind the glass partition.

If an empty bowl or aquarium filled with water is arranged in the rear compartment and a bowl or aquarium of like character containing fish is arranged in the front compartment, upon illuminating the compartments alternately it will appear to the ob-

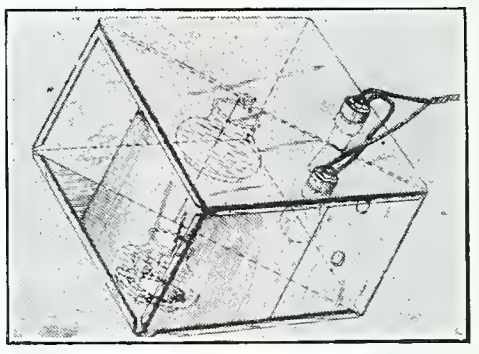


FIG. 3.

server at the sight opening that fish are alternately present and absent from the same bowl. A like illlusion can be produced by the use of two vases arranged in the respective compartments, one containing flowers and the other none, the flowers seemingly appearing and disappearing from the same vase as the compartments are alternately lighted.

A curious effect is produced if the left part of the rear wall behind the glass and the front part of the right wall are withdrawn and the faces of different persons placed therein, with curtains hiding the box except the opening. Alternate illumination of the compartments produces the impression that the faces of the persons are changing from one to the other. Instead of these, a skull may be used in one opening, and the flesh will seem to shrink away or reappear on the grinning bones at will.

In this way the electric illusion device serves as a toy for entertainment; but when it is desired to use the same for advertising purposes, the price and description of an article may be placed in one compartment and the article referred to in the other, the description and article appearing and disappearing before the eyes of the spectator as the compartments are lighted alternately.

When the lighting is effected quickly, the change in appearance of the object also occurs quickly, but when the light in one compartment is diminished gradually while the light in the other is increased in the same measure, the object in the former gradually fades away, while that in the latter becomes more distinct, beginning with a phantom-like image and growing more clear until complete transition has been effected.

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CREATING AN OCEAN HARBOR.

By CHARLES ALMA BYERS.

THE straightest and shortest line that can be drawn across the map of the Pacific Ocean from the Orient to the west coast of America would make its terminus on this side within a few miles of San Pedro, a small city, with a present population of probably 6,000, on the coast of Southern California, twenty-five miles south of Los Angeles. Because of this fact, and realizing that Southern California requires a convenient link between itself and international commerce, the government of the United States, for several years, has been superintending the construction at this point of an ocean harbor that will ultimately become of the utmost importance in the carrying on of commercial relations between this country and the Orient. It will be a port that will furnish an immediate outlet and inlet for the rapidly growing volume of trade of the Great Southwest, instead of necessitating shipment by rail via San Francisco, and that will in many other ways be of benefit in this country's development.

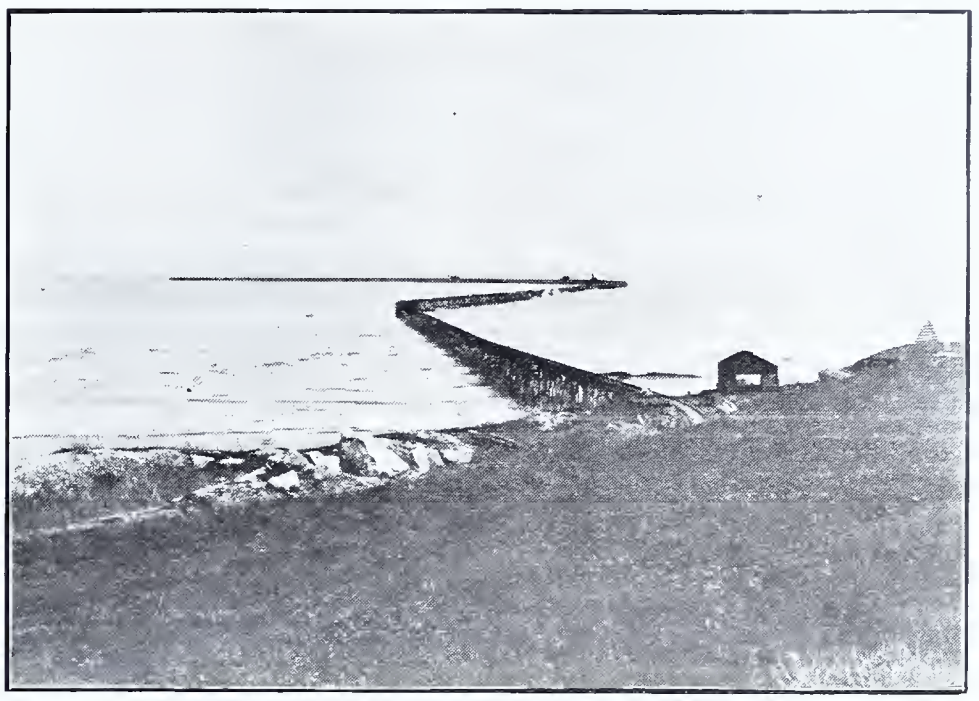
Nature has been kind to San Pedro harbor, furnishing an excellent "foundation." It has provided Santa Catalina Island and Point Fermin as protecting bulwarks against huge seas, besides favoring it in smaller ways. In fact, as U. S. Engineer Fries says, "In the five hundred miles between San Francisco and San Diego, San Pedro is the nearest approach to a natural harbor."

But man had also had an important hand in its making. Nature did not complete its task, but left San Pedro, like many another now famous harbor, sadly lacking in safe anchorage room. Something in the nature of a huge breakwater was needed. As early as 1886 a survey was made and a report rendered pointing out such a need, the suggested breakwater to be built in two parts and to cost approximately $4,000,000. The plan proposed was that the shore arm of the work should be 4,000 feet long and the terminating arm 3,500 feet long, with a space of 1000 feet intervening. A similar breakwater was again proposed by a board of army engineers in 1890, but the cost this time was estimated at $4,500,000. Neither of these reports led to action, and a second board of army engineers in 1892 reported in favor of a continuous arm 8,500 feet in length, estimated to cost $2,885,000.

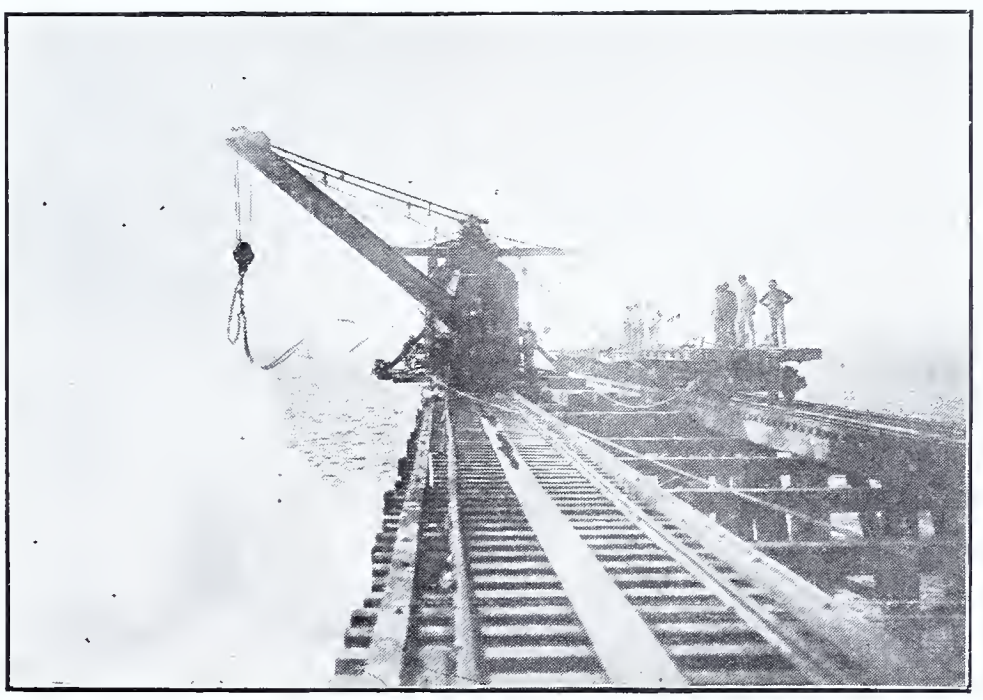
The latter report attracted favorable attention; and Congress in 1896 passed a bill appropriating $2,900,000 for a breakwater "for commerce and of refuge," at either San Pedro or Santa Monica, and authorized the appointment of another engineer board to make further investigations before work should be commenced. The board decided upon San Pedro.

The plan for the breakwater finally decided upon provided for a continuous arm, to begin 1,800 feet from the shore and to be 8,500 feet in length—or as much longer as the money appropriated would permit. It was to consist of two straight sections connected by a three-degree curve.

Actual work was begun on the breakwater in 1899. The contract of that time, however, was declared forfeited within a year because of the slow progress being made, and a new one, now in force, was entered into in June, 1900. Work was recommenced in the following August, and has been in almost steady progress ever since. Capt. Amos A. Fries, U. S. Army Engineer, is in charge of the work, and he announces that the money appropriated in 1896 will be sufficient to build the structure 9,000 feet long. Nearly 90 per cent of the length is now completed, and it is expected that the work will be finished within a year. About $2,500,000 of the $2,900,000 appropriation has been expended to date.



SAN PEDRO BREAKWATER.



UNLOADING SUBSTRUCTURE FOR THE BREARWATER. A HUGE STONE HAS JUST FALLEN FROM THE CHAIN SLING.

The construction of the breakwater was carried out along simple lines. The course of the proposed arm was first marked by a pile-supported railroad bed, double-tracked. The breakwater was built up to low tide water with rubble stone, which was dropped from derricks or pried from flat cars with crowbars. The weight of these stones varied from one hundred pounds to fifteen and twenty tons, two-thirds of them averging over half a ton each. The width of this substructure at low water was designed to be thirty-eight feet, but in practice it has been increased to nearly forty-eight feet.

The superstructure begins at low water and is fourteen feet in height, two walls being built in courses with rectangular blocks of granite. The one on the ocean side consists of four courses, each three and one-half feet thick and containing no stone that weighs less than 16,000 pounds. The one on the harbor side is composed of seven courses, each two feet thick and possessing no stone weighing less than 6,000 pounds. The space intervening between the two walls is filled with stones of all sizes. Between the outer edges of the bottom courses the width is thirty-eight feet and at the top it is twenty feet. The courses on the harbor side are set in above the bottom three feet four inches and those on the ocean side one foot four inches.

On January 1 of the present year stone amounting to about 2,300,000 tons had been used. All stone above water and about 74½ per cent of that below is granite, which was shipped from quarries near Riverside, Cal., about seventy miles from the work. The weight of this granite varies from 160 to 170 pounds per cubic foot. The balance of the stone is sandstone, which came from quarries about sixty miles distant.

The breakwater, when completed, will shelter from storm waves an area of 350 acres, with a depth of from thirty to fifty-two feet at low tide, and over 200 acres more, from twenty to thirty feet deep at low tide. In this space the largest steamers and vessels of all kinds may lie in safety. The ocean vicinity is largely protected by Santa Catalina Island, about twenty miles out, and by Point Fermin, on which is built the Government lighthouse, to the south, which will also do much toward keeping the breakwater intact. The enclosed space, with an entrance 4,000 feet wide, will be easy of access at all times. A vessel will need only to round the breakwater, even during severe storms, to find refuge in calm water. The waves that will run through the 1,800 foot gap between the breakwater and the shore will make, during storms, a comparatively large shoal-water area inside the breakwater very rough, but not dangerously so; and doubtless the opening in the near future will be closed. This area will later be reclaimed, however, by the construction of bulkhead and fills to the shore. Along the shore inside will be warehouses, wharves, tracks and all the usual harbor appliances.

The area protected by the breakwater is known as the outer harbor. Lying back of it, with what is known as Deadman's Island as its guard and sentinel, is the inner harbor of San Pedro, where at present over one million tons of freight are unloaded every year. Here today there is available one mile of harbor, with widths of from 500 to 800 feet, twenty-five feet deep at low tide. The entrance to this inner harbor has a low-tide depth now of only from twenty to twenty-three feet, but, owing to the fact that the breakwater prevents swells, vessels drawing twenty-five feet can enter at mid or high tide and load or unload at pleasure. Dredging, which will cost about $500,000, will deepen the entrance. In this way a turning basin 1,600 feet in diameter can be created in the harbor. the entrance can be made thirty feet deep, and a frontage of 15,000 feet can be made available.

San Pedro will some day become an important harbor, and though largely artificial it will be none the less substantial. Many famous harbors has been created by man—for instance, Alexandria, in Egypt: Cherbourg, in France; Genoa, in Italy; Plymouth, in England: Chicago, Buffalo, and Cleveland, on the Great Lakes, and others.

MECHANICAL INVENTIONS AND DESIGNS.

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Tbomas J. King, Richmond, Va. Scale.—An object of tbe present invention is to provide a scale, designed particularly for weighing letters and other mail matter, and equipped with clamping means adapted to firmly hold a letter while it is being weighed, and capable of enabling the same to be readily placed on and removed from the scale.

John P. Ashby, Okla. City, Okla. Sectional Metallic Cross Tie.—An object of tbe present invention is to provide a metallic cross tie, possessing tbe desired elasticity and equipped with rail engaging means capable of firmly clamping the rails without being affected by tbe expansion and contraction of tbe metal of thecross tie.

William H. Sberidan, Sadler, Tex. Animal Trap.—An object of tbis invention is to provide a self-setting and ever-set animal trap, adapted for capturing various kinds of animals without permitting the same to obtain the bait, so that the trap will not require attention and will remain baited for a considerable lengtb of time. Another object of the invention is to provide a trap, wbicb will effectually precipitate into it an animal attempting to obtain the bait, and which will destroy the captured animal so tbat it may be readily emptied from tbe trap.

Mark A. Brown, inventor, Cbattanooga, Tenn.; Thomas J. Arline, assignee, Savannab, Ga. Non-refillable Bottle.—An object of the present invention is to provide a non-refillable bottle, adapted to be readily corked after it has received its original contents, and capable of permitting the same to be freely decanted and of effectually preventing a liquid from being introduced into it, thereby avoiding all adulteration and fraudulent refilling. Another object of tbe invention is to provide a non-refillable bottle equipped witb an automatic valve, which will be opened only by the downward flow of the contents of the bottle, and wbich will remain closed in all positions of tbe bottle after the contents thereof have been consumed, so that the bottle cannot be partially filled by immersing it in a receptacle containing a liquid. It is also the object of the invention to provide means adapted, without interfering with the free flow of the contents of the bottle, to prevent an instrument introduced into tbe neck of the bottle from operating the valve.

Mark A. Brown, Chattanooga, Tenn. Non-refillable Bottle.—An object of this invention is to provide a non-refillable bottle, adapted to be readily sealed after it has been filled and capable of effectually preventing the introduction of a liquid into it after it has received its original contents.

Mark A. Brown, Chattanooga, Tenn. Non-refillable Bottle.—An object of this invention is to provide a non-refillble bottle, having an automatic valve adapted to dispense witb the ordinary stopper and capable of enabling tbe contents of a bottle or analagous receptacle to be freely decanted, and of being positively closed when relieved of internal pressure incident to pouring the liquid from it. Another object of the invention is to enable a non-refillable bottle of tbis character to be easily blown, and to effectually prevent a wire or other instrument from interfering witb tbe operation of the valve.

Mark A Brown, Chattanooga, Tenn. Non-refillable Bottle.—An object of tbe present invention is to provide a non-refillable bottle, designed particularly for sauce, catsup and other liquid condiments, medicine, perfumes and other liquids, of whicb only a comparatively small amount is consumed at eacb use of the bottle, and capable of permitting sucb liquid to be shaken from it without liability of discbarging too great a quantity. Another object is to provide a bottle of this cbaracter, whicb may be readily molded and wbich will not require any tool work on its exterior, whereby tbe cost will be reduced to a minimum. Tbe invention also has for its object to provide a non-refillable bottle having a spring-actuated valve, and provided with means for preventing the spring from being injured and rendered inoperative by tbe shaking of tbe bottle to discharge its contents.

William H. Parham, Paducah. Ky. Wbeel.—An object of tbis invention is to provide a higbly resilient shock-absorbing wbeel, designed for use on various kinds of vebicles, motor cars and tbe like, and capable of affording tbe desired resiliency to adapt it for tbe use to wbich it is to be put and to enable it to be equipped witb any kind of tire. Anotber object of tbe invention is to equip tbe wbeel with adjustable means for increasing and diminisbing its resiliency, as desired.

William H. Parbam, Paducah, Ky. Cusbion Tire.—An object of tbe invention is to avoid tbe use of unreliable pneumatic tires, and to enable the same to be made puncture-proof or non-collapsible from puncture, and to provide a tborougbly reliable spring metal boop or cushion tire, designed for use on various kinds of wheels and adapted to afford tbe necessary resiliency to suit the character of the vehicle to wbich it is to be applied.

Rollings A. Clements, Stephenville, Texas. Revolving Kitchen Cabinet.—An object of this invention is to provide a kitchen cabinet, adapted to economize space and save time and labor in the preparation of articles of food, and capable of ready access to its contents. Another object of the invention is to provide a combined kitcben cabinet and kitchen table, adapted to afford full use of the top of the table and capable of bolding witbin easy reach the various articles necessary for the preparation of food, so that a cook may obtain tbe same without moving from the table.

Edward C. Bates, Grand Forks, N. D. Device for Holding Collars and Necktie.—An object of the present invention is to provide a collar and necktie holder, designed particularly for use in barber shops, and adapted to be readily applied to the arm of a barber's chair, a shelf or other convenient place, and capable of securely holding a collar, necktie, or other small article without soiling or mussing the same. Another object of tbe invention is to provide a device of tbis character adapted to be readily operated for enabling a collar, necktie, etc., to be placed on it, and capable when released by the operator of automatically clamping tbe articles.

Chas. J. Streams, inventor; Henry H. Wason, assignee, Amethyst, Colo. Hasp Lock.—An object of tbis invention is to provide a hasp lock, adapted to be locked and unlocked by a key, and capable of concealing the screws, or other fastening devices, for securing it to a door and its jamb, so that the lock cannot be removed surreptitiously witbout breaking it.

Samuel Walter, Dallas City, Ill. Broom Holder.—This invention has for its object to provide a broom holder designed to be secured to a wall, or other supporting surface, and adapted to enable a broom handle to be readily introduced into it, and capable of securely clamping such bandle for supporting tbe broom.

Robert B. Richardson Jr., and Jas. S. Robertson, Paducab, Ky. Switch Stand.—An object of the present invention is to provide a switch stand, equipped witb means for permanently locking the switch lever in its customary position, and for temporarily locking tbe said lever wben the switch is operated to run a train on a siding or for any other purpose.

William B. Tbomas, McRae, Ga. Combined Sasb and Shutter Lock.—An object of the invention is to provide a combined sash and shutter lock, designed particularly for use in warm weatber, and adapted to lock the shutters or blinds of a window in their closed position, and capable of enabling both sashes to be held at any desired adjustment, whereby the necessary ventilation may be obtained without affording an opportunity for burglars, or other intruders, to enter a bouse.

Charles E. Hawn, Little York, Ind. Gate.—An object of the present invention is to improve the operating mechanism for opening and closing swinging gates and the means for locking the same, and to provide efficient operating mecbanism adapted to enable a gate to be readily opened and closed without dismounting from a horse or leaving a vehicle, and capable of forming a lock for positively bolding the gate in its open and closed positions.

Stepben P. Rush, inventor; John B. Beam, assignee, Tyrone, Pa. Combined Brace and Fastener for Hatchets.—An object of tbe invention is to provide a combined brace and fastener, adapted to be readily applied to a hatcbet, and capable of securely fastening tbe head on tbe bandle, and of strengthening the latter at tbe point where it is subjected to tbe greatest strain and is most liable to break.

Oscar Herrmann, Brown Station, N. Y. Illuminated Sign.—An object of tbis invention is to provide an illuminated sign, designed particularly for the use of pbysicians, and adapted to be readily mounted on tbe interior of a window for displaying tbe name of a doctor, or otber sign matter. Another object of the invention is to provide an illuminated sign, adapted to be secured to the lower sash of a window and to be carried by the same in the vertical movement thereof, and capable of affording ready access to the lighting device and of preventing the flame from injuring the curtain or draperies of a window.

Paul P. Ankerson, Davenport, Ia. Washing Machine.—An object of the present invention is to provide a washing machine, equipped witb a movable agitator and an oscillatory body, adapted to present curved rubbing surfaces to the clothes, and capable of utilizing its momentum for actuating tbe agitator, wbereby the machine may be conveniently operated by a child or adult.

Benjamin F. Carey, Texas City, Tex. Sham Pillow.—An object of tbe present invention is to provide a pair of sham pillows, adapted to be compactly folded together and bung up out of the way, when not in use, to avoid soiling tbe pillow shams. Another object of the invention is to provide a pair of sham pillows on which the pillow shams will be securely held when in use, and from which it will be unnecessary to detach the pillow shams when the sham pillows are removed from the bed.

Philip Dionne, Beaverville, Ill. Hame.—The object of the present invention is to equip a pair of hames witb means for adjustably connecting tbe ends of the hame strap with tbe upper portion of tbe hames, and for permitting the said strap to be readily raised and lowered to adapt the hames for different sizes of horse collars and horses.

William E. Veasey, Lewes, Del. Signaling Apparatus.—The object of the present invention is to provide a signaling apparatus, designed for use on both land and water, and adapted to display a flag or set of flags in the most advantageous position to be read by the party to whom tbe message is to be delivered. Another object of the invention is to display a flag or set of flags in any direction irrespective of the direction of the wind, and to securely support the flags and to prevent the same from being blown off the apparatus. The invention also bas for its object to provide means for quickly turning the apparatus for cbanging the position of the flags, to display tbe signal in a different direction.

Edward L. Pence, inventor; J. E. Richardson, assignee, Memphis, Tenn. Split Pulley.—An object of this invention is to provide a wooden split pulley having a sectional metallic hub, adapted to enable the pulley sections to be readily separated and assembled. Another object of the invention is to provide a sectional hub having means for interlocking its sections witb the sections of the pulley, whereby the bub sections will be firmly secured to the pulley sections and maintained in proper relation witb the same.

Frank H. Rodrigues, inventor; Geo. T. Griffin, assignee, Connellsville, Pa. Baby Carriage.—The object of the present invention is to equip a baby carriage with steering mechanism for enabling tbe direction of the front wheels of a baby carriage to be readily changed without lifting them from tbe ground, and also witbout releasing the handles by means of which the baby carriage is propelled. Another object of the invention is to enable the steering mechanism for changing the direction of the front wheels to be readily locked against movement to maintain the front wheels straight or in alinement with the rear wheels, wben the carriage is left in charge of a small cbild or otber incompetent person.

Gustaf F. Johnson, Superior, Wisc., inventor; William G. Roberts, Superior, Wisc., assignee. Envelope Sealer and Stamp and Label Affixer.—An object of the invention is to provide an efficient device, adapted to moisten and seal envelopes and capable of affixing stamps to the same and of applying gummed labels to various articles. Another object of the invention is to provide an envelope sealer and stamp and label affixer, adapted when not in use to have its moistening means supported out of contact with a desk, and provided witb package-opening means also adapted to support the moistening roller in a slightly elevated position out of contact with the supporting surface upon which the device is placed. The invention also has for its object to equip the device with a conveniently arranged blade for opening envelopes and for various other purposes, and to afford convenient access to the stamps or labels.

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FOR SALE—U. S. Patent No. 861,872, dated July 30, 1907. Ventilator. Can be used on board of ships as well as on private or public buildings. Address, Roderick MacDonald, Fletcher St., Glace Bay, N. S., Canada. feb

FOR SALE or on Royalty—U. S. Patent No. 887,742, issued May 12, 1908. Set Saw Gauge, also Canadian patent of same. Address, J. S. Scott, P. O. Box 372, Fredericton, N. B. Canada. feb

FOR SALE—Package Tie, U. S. Patent No. 896,472, and Canadian Patent No. 113,775; English patent pending. For sample and information write, Dr. E. L. Sharpe, Pleasanton, Texas. feb

FOR SALE—Patent No. 896,534. Improved Nut Lock. The best nut lock of the present age, for railroad or automobile work. Inventor. A. L. Hart, Box 866, Barnesville, Ohio. feb

FOR SALE—Patent No. 896,073, dated August 18, 1908. Rachet Wrench. Handy device for mechanics and farmers. Will sell outright. Correspondence solicited. Address, Theodore Atzenweiler, R. F. D. No. 1, Huron, Kansas. feb

FOR SALE or on Royalty—U. S. Patent No. 896,095; a bottle with a detachable strip of glass attached to lower end to form seal over mouth of bottle. Strip to contain all blown in names of letters or marks, by which bottle can be used for fraudulent purposes. Address, H. E. Erwin, Hazel, Kentucky. feb

FOR SALE—U. S. Patent No. 897,894. Out-Trapping Fly Escape Screeu, which will trap all the flies in a room, and will do away with all the fly poison and sticky paper. Can be manufactured for 10 or 15 cents a piece. Address, Henry A. Hanson, Grano, North Dakota. feb

FOR SALE—U. S. Patent No. 898,049, issued September 8, 1908. Folding shipping case, Made of wood and fibre board. Strong, ligbt, and convenient. Can be used several times. Testimonials from manufacturers of boots and shoes and other commodities, who have used it. Big profits. Address, Malcolm Hutchinson, Muskegon, Mich. jan

FOR SALE—Patent No. 894,948, dated August 4, 1908. Broad-cast Distributor. Distributes evenly, saving from 10 to 25 per cent in seed Prevents grain from striking block which does away witb seed bouncing to one side, causing thick streaks. Will sell outright or on royalty basis. Address, V. G. Gutbrie, Box 321, Winters, Yolo County, California. jan

FOR SALE—Patent No. 893,030. Composite Railway Tie, dated July 14, 1908. Made up of metal and concrete. Can be readily placed in position and is of durable construction Easily manufactured. Address, B. A. Steinke, Botkins, Ohio. dec

FOR SALE — Patent No. 891,052, dated June 16, 1908. Non-Refillable Bottle. For sale outright or royalty basis. Very simple and effective. For full particulars address, H. F. Erfman, Miamisburg, Obio. feb

FOR SALE—Patent No. 712,173, dated October 28, 1902. A Non-Refillable Bottle. Address, Matthew M. Beam, Oldforge, Pa. feb

FOR SALE—Patent No. 893,992, dated July 21, 1908. An all around level; pitch, plumb, or any inclination. Cheap for cash. Address, Fuessel Bros., Box 85, Hicksville, N. Y. feb

FOR SALE—Patent Nos. 886,283, 898,807, and 891,647. Tbis will build a complete gasolene engine, and will sell outright or in any way the purchaser desires. Address, Wm. L. Wayrynen, L. Box W., Norden, S. Dak. feb

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FOR SALE — Patent No. 892,794. Improved Guard Attachment for Sewing Machines. Price $2500. Only guard which entirely shields fabric from driving mechanism of machine. Adjusted to any high-arm make. Cost of manufacturing 10 cents each. An easy seller at $2.00. Address, Miss E. Bailey, Fordoche, La. feb

FOR SALE—Patent No. 898,328, dated Sept. 8, 1908. Mechanical Movement. May be used as a gig drill; a coal auger; mining drill; and for automobile shaft. Patent No, 898,329, dated September 8, 1908. Automatic Hook. Quickly releases the load witbout letting out tbe slack; will be found helpful in both shop, and releasing life boat from the falls in time of storm. Cash or royalty. Address, C. J. Coulter, Longmont, Colorado. feb

FOR SALE—Patent No. 782,373, dated Feb. 14, 1905. Stalk Cutter. Designed for cutting corn for the silo. Desire to sell outright. Address, George W. Whitcomb, Duff, Nebr. jan

FOR SALE—U. S. Patent Serial No. 388,382. Jar lifter for handling jars and cans of bot fruit etc. Cheap to manufacture and a useful article for tbe kitchen. Address, J. W. Gienger, Buck Valley, Pa. dec

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FOR SALE—Patent No. 891,422. Automatically Balanced Vertical Centrifugal Pump, Simple and efficient and reduced to practice. Address, A. W Hunsaker, 988 W. Libbie St., Pomona, California. dec

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FOR SALE—Patent No. 893,501, dated July 14, 1908. Butter Mold. Will sell reasonably at once. Address, Elmi Huber, Ingalls, Ind. jan

FOR SALE—Patent No. 894,953, dated August 4, 1908, outright or state rights. A measure filled and emptied without handling. Address, Dave Howe, Upson, Wisc. jan

FOR SALE—Patent No. 797,887, Pail Cooler. For casb or cash and royalty. Address, C. F. Dibble, Rochester, Minn. jan

FOR SALE—Patent No. 893,183, dated July 14, 1908. Drenching Bottle. Something new and very useful. A great necessity wherever cattle of any kind are kept. Address, Mrs. S. A. Meddaugh, North White Lake, Sull. Co., New York. jan

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FOR SALE - Patent No. 892,992, July 14, 1908. Road scraper, which is peculiarly designed so as to automatically return to an upright position after having been dumped. Address, F. Heyer, Hubbard, Texas. jan

FOR SALE—Patent No. 864,692, dated August 27, 1907. End gates for wagon boxes. Will sell outright, or on royalty. Want correspondence with wagon manufacturers. Address, Artbur Roberts, Damar, Kansas. dec

FOR SALE or royalty—Animal toys made from card board or paper material. Cheaply manufactured. Amusing and instructive. Would be great sellers. Address, W. T. Wood, Nashville, Tenn. dec

FOR SALE—Seven new patents—brooders or incubators; apparatus for cotton spinning; funnels for filling bottles; ring knot twine cutter; also British patents. Address, John H. Turcotte, 69 Union St., Springfield, Mass. dec

FOR SALE—Patent No. 886,243, dated April 28, 1908. A washing machine stove tbat rubs and also boils the cloths in the same vessel. Will sell any way to suit purchaser. Address, M. A. Patten, Milltown, Ga. dec

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FOR SALE—U. S. Patent No. 850,286, Serial No. 241,371, patented April 16, 1907. Horseshoe Calk. Address, Jesse T. Bell, 49 Broad St., Washington, N. J. dec

FOR SALE—U. S. Patent No. 886,214 issued April 28, 1908. Seam closer for sheet metal cornice work and tin roofs. A handy tool for the shop. Will sell reasonably. For particulars address, Asia F. Houch, 27 South 9th St., Easton, Pa. dec

FOR SALE—Patent No. 891,188. Desk Attachment. Sometbing entirely new. Will pay to investigate. Prefer to sell on royalty basis. Address, Henry Schenk, 321 Glendale Ave., Howell, Ind. dec

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WANTED—An individual or corporation to undertake the manufacture of Automobile Sled Attachments, Patent No. 888,932. Investigate if interested. Address, H. H. Rohlf, New London, Wisc. dec

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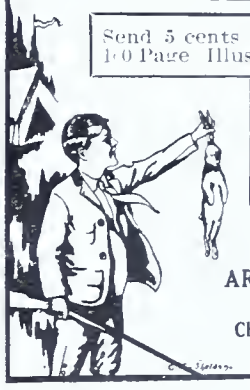
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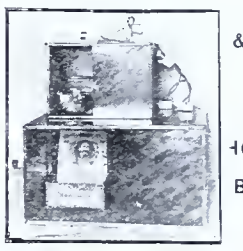
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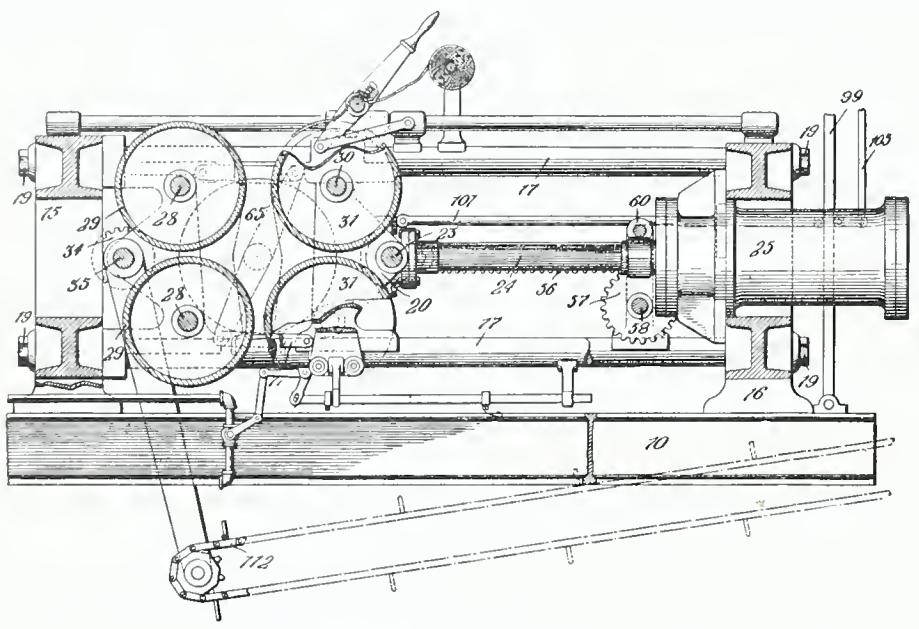
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CLEVER NEW PATENTS.

ROLLER PRESS.—SWINGLETREE.—SKIRT MEASURING DEVICE.

Roller Press.

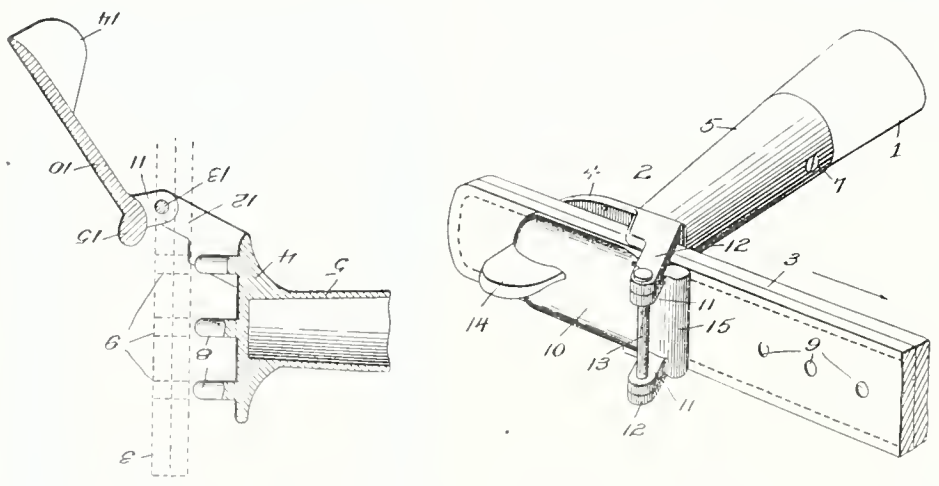
A roller press for cylindrical cotton bales which has the unique characteristic of increasing the compression during the formation of the bale, so that the outer layers are condensed to a much greater extent than the core portion, has recently been patented by Edgar Reagan, of San Antonio, Texas. The press is arranged to receive a wound core or small bale, and to wind thereon a bat of any desired length, condensed as desired. In this class of devices there is a common tendency to irregular movement of the movable housings, due to unevenness in the thickness of the bat; another difficulty encountered in operating roller presses is in maintaining the ends of the bales straight. This invention provides a novel form of head plate which revolves with the bale, so that there is no friction and the ends are in such condition as to permit general examination. The uneven movement of the housings is also obviated.



A cylinder 25 contains fluid which is held at any desired pressure, and resists the outward movement of the compression rolls as the diameter of the bale increases. Gearing connections are so arranged that all of the rolls will be constantly driven, and during this movement the movable housings are free to move out from the fixed housings as the bale grows, without disturbing the driving connections. In order to make the movement of the housings regular, racks and pinions 56, 57, are provided, and any rearward movement of one housing acts through the adjacent rack bar to turn the shaft 58, and the motion will be transmitted through the opposite rack bar to the second housing, so that under all circumstances the axes of the four compression rolls will remain parallel. Small revoluble end disks 65 are provided, with their axis of rotation in the same plane as the axis of rotation of the bale. One of these disks is arranged to move outward from the end of the bale after the bale forming operation, to permit the discharge of the bale from the press. The disks being free to rotate, there is no friction between them and the ends of the bale, and the cotton cannot be injured by contact with said disks. The density of the bale may be increased or decreased by adjusting the degree of pressure of the fluid within the cylinder and by adjusting the point at which the increase of pressure commences.

Swingletree.

One of the great objections to ordinary swingletrees is that the traces are free to oscillate with the movement of the horse, which causes the parts to gradually wear away, resulting in breakage. A recent invention is so designed that there will be no movement on the trace at its rear end, accom-



panying the up and down movement of the horse as in trotting. It is also arranged so as to permit the trace to be conveniently and quickly attached or detached, and the construction is such that the holding effect becomes greater as the draft on the trace increases. In order to effect this result, the swingletree is provided with a head 4 (see drawing) formed integral with a sleeve 5, whereby a ferrule-like body is presented. Extending out from the head 4 are spaced lugs 8, formed integral therewith and having their outer ends rounded so as to freely receive the trace. The trace has groups of horizontal apertures 9, and it can be lengthened or shortened by inserting the lugs 8 into anyone of the groups of openings 9. In order to hold the trace on the lugs a keeper 10 is employed, which is a hinged member provided with ears 11 at one end, that engage between arms 12, extending out from the head 4. These arms and ears are apertured to receive a pintle 13, whereby the keeper is free to swing away from the head 4. The arms 12 are so arranged and proportioned as to permit the trace to be moved longitudinally between the arms at the top and bottom and the hinged end of the keeper and lugs 8 at the sides. A cam 15, adapted to engage the trace, extends in from the hinged end of the keeper, and the object of this is to cause the draft on the trace to hold the keeper tightly in position, and thus constitute a lock to prevent the keeper from opening. In practice the trace, having been fastened, can be moved from the front between the keeper and the lugs 8. While the openings are in register with the lugs, the trace is pushed so as to engage over on the lugs. The keeper 10 is then swung closed, and the cam causes the trace to be offset at that point. Hence, as draft is applied, the trace acts on the cam so as to move it forward and thus hold the keeper in contact with the extremities of the lugs 8. In detaching the trace, it is only needful to ease up on the latter and swing the keeper outward, whereupon the trace can be disengaged from the lugs and pulled out of the holder. The arrangement is such that the trace has no oscillatory movement about the point of attachment of the swingletree, so that wear of the parts is prevented. The device was patented by Samuel D. Riegel, of Experiment, Ga., and one-half interest has been assigned to Jessie C. Turnipseed, of Griffin, Ga.

Skirt Measuring Device.

A device that will be found most useful and convenient by dressmakers has been invented by Nancie E. Miles, of Indianapolis, Ind. It solves the problem of obtaining the exact measurement of the length of a skirt, and it may be used either by the person wearing the skirt, or by the dressmaker. As shown in the accompanying illustration, it consists of a measuring tape 1, provided with a weight 2 at its lower end and arranged to be joined to a belt 10 by a special adjustable device. A plate 3 is slidably connected at its ends to the belt, through the medium of vertical slots 5, and is provided with a depending central portion 6, this latter being similarly provided with transverse slots 7 at each end. The tape is passed through the back of the lower slot 7 and through the outer part of the upper slot 7 of the depending portion 6, and has its outer end secured to the plate 3 by means of a rivet 8 provided with a head or handle 9.

When the belt is adjusted to the waist of a person, the tape is drawn up through the lower slot 7 of the portion 6, so as to form a loop 11. The operator then takes hold of the loop and lowers the weight until it touches the floor. She then applies the tape to the waist line and notes the number of inches at that point on the tape, which indicates the distance from the waist line to the floor. She then draws the tape up as many inches



as it may be desired for the skirt to clear the floor, and the correct skirt length is thereby obtained. By moving the slide on the belt to the sides and back, the exact length of the skirt at all points may be obtained.

PATENTS

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

—:o:—

POTTER v. LAKE SHORE NOVELTY CO.

(Circuit Court of Appeals, Sixth Circuit. June 26, 1907. 155 F. R. p. 278.)

PATENTS—INVENTION-DETONATING DEVICE.

The Potter patent, No. 689.906, for a detonating device for exploding toy torpedoes, is void for lack of invention and anticipation.

BLAKE & KNOWLES STEAM PUMP WORKS v. WARREN STEAM PUMP CO.

(Circuit Court, D. Massachusetts. August 2, 1907. 155 F. R. p. 285.)

1. PATENTS—INVENTION-NEW COMBINATION OF OLD ELEMENTS.

Where a patented structure, although a combination of old elements, is new, and capable of a use which is new and of special utility, and in such use constitutes an important advance in the art, it cannot be denied patentability because other uses are also claimed for it, in which it is not a substantial advance on the prior art.

2. SAME—INFRINGEMENT—PUMPING ENGINE.

The Whiting & Wheeler patent, No. 526,913, for a pumping engine intended for use as an air pump for withdrawing the water and air from the condenser of a steam engine, was not anticipated and discloses patentable novelty and invention. The Hall & Gage patent, No. 522,938, for a combination which includes a special valve movement for use in connection with such pump, also held valid, and both patents held infringed.

GENERAL ELECTRIC CO. v. E. B. LATHAM & CO.

(Circuit Court, S. D. New York. July 23, 1907. 155 F. R. p. 293.)

PATENTS — ANTICIPATION — ELECTRICITY METERS.

The Duncan patent No. 550,823 for improvements in electricity meters of the motor type claims 1 and 8, the essential feature of which is a magnetic shield inserted between the armature and the damping magnets to protect them from the influence of the field coils, are void for anticipation and lack of patentable novelty in view of the prior art and publications.

HOTEL SECURITY CHECKING CO. v. LORRAINE CO.

(Circuit Court, S. D. New York. July 2, 1907. 155 F. R. p. 298.)

1. PATENTS-NOVELTY-METHOD OF ACCOUNT CHECKING.

The Hicks patent, No. 500,071, for a method of and means for cash registering and account checking, designed to correctly check the account of each individual waiter and of the cashier employed in a hotel or restaurant, and to prevent peculation and collusion between customers and waiters to defraud the proprietors, is void for lack of patentable novelty and invention; the method shown differing in no patentable sense from those previously in use.

2. SAME—EVIDENCE OF INVENTION-EXTENT OF USE OF PATENTED ARTICLE.

Where there is no invention, the extent of the sales and use of the patented article is immaterial to sustain the patent.

HAVANA COMMERCIAL CO. v. NICHOLS et al.

(Circuit Court, S. D. New York. June 19, 1907. 155 F. R. p. 302.)

1. TRADE-MARKS AND TRADE-NAMES-NAMES SUBJECT TO APPROPRIATION — "LA CAROLINA."

The name "La Carolina," as a trade-mark for cigars, is not invalid as either the name of an individual or a geographical name, and is infringed by the name "La Coralina," used also for cigars.

2. SAME—SUIT FOR INFRINGEMENT—PRELIMINARY INJUNCTION.

While mere delay or acquiescence will not defeat the right to an injunction to restrain infringement of a trade-mark, it may afford good ground for denying a preliminary injunction to put a stop to an established business prior to a final hearing.

WESTON ELECTRICAL INSTRUMENT CO. v. EMPIRE ELECTRICAL INSTRUMENT CO. et al.

(Circuit Court, S. D. New York. Feb. 18, 1907. 155 F. R. p. 301.)

PATENTS — SUIT FOR INFRINGEMENT — INCREASE OF DAMAGES.

The conduct of defendants in a suit in equity for infringement of a patent held to have been such, in deliberately and intentionally infringing, in purposely protracting the litigation, and in transferring the property of the corporation, which was the principal defendant, for the purpose of rendering a recovery nugatory, as to warrant the court in imposing triple damages, under Rev. St. § 4921 [U. S. Comp. St. 1901, p. 3395].

MOXIE NERVE FOOD CO. OF NEW ENGLAND v. MODOX CO. et al.

(Circuit Court, D. Rhode Island. June 22, 1907. 155 F. R. p. 304.)

TRADE-MARKS AND TRADE-NAMES—SUITS FOR UNFAIR COMPETITION—COSTS.

In a suit for unfair competition in trade where the charge made against the defendant is established, but, owing to fraudulent representations made by complainant in respect to its goods, it is not entitled to relief in equity, neither party will be allowed costs.

DEITSCH et al. v. GEORGE R. GIBSON CO.

(Circuit Court, S. D. New York. Aug. 12, 1907. 155 F. R. p. 383.)

TRADE-MARKS AND TRADE-NAMES SUIT FOR INFRINGEMENT—PRIORITY OF RIGHT.

A firm commenced the use of a name as a trade-mark for tooth brushes in 1883, and continued such use until its failure about 1890, and during the same time defendant used a similar name for brushes sold by him. On being sued for infringement, he promised to quit, but, the firm soon failing, he did not. After the failure complainant's assignor, who had become a partner shortly before, appropriated the trade mark as his own, and had the same registered. Held, that he was not the legal successor of the firm, and obtained no right from defendant's promise, but his right dated only from the time of his own use, which, being later than defendant's, afforded no ground upon which complainant was entitled to enjoin defendant as an infringer.

AJAX METAL CO. v. BRADY BRASS CO.

(Circuit Court, D. New Jersey. July 31, 1907. 155 F. R. p. 409.)

1. PATENTS—INVENTION — SUBSTITUTION OF MATERIALS.

While the substitution of one material for another is not as a rule patentable, there are exceptions to such rule, and, under some circumstances, the adaptation of certain materials either singly or in combination to the production of certain desired results may amount to invention, even though it involves no more than the taking advantage of certain inherent qualities developed or discovered experimentally. This is particularly the case with respect to composite mixtures or alloys of metals.

2. SAME—VALIDITY AND INFRINGEMENT—ALLOY FOR JOURNAL BEARINGS.

The Hendrickson and Clamer patent, No. 654,402, for an alloy for antifriction bearings, which consists of a copper tin-lead alloy, having "less than seven per cent. of tin and more than twenty per cent. of lead and the balance of copper," covers a superior alloy for journal bearings, having a higher percentage of lead, which is the lubricant, than it was previously thought possible to make successfully. It discloses invention, and is not void for anticipation nor lack of novelty, nor because of prior knowledge and use of the invention. Nor is it invalid for indefiniteness, in that it specifies only the maximum limit of tin and the minimum limit of lead in the alloy, it having been discovered by the patentees by experiment that within such limits, a critical relation exists between the metals, whereby, on being fused together, the copper-tin matrix, which holds the lead in suspension, solidifies quickly at a high temperature, and retains properly distributed through it, before it has time to run off or settle, a greater quantity of the lead (which solidifies at a still lower temperature) than when other proportions are used, and the description, therefore, gives a practical working formula to those skilled in the art, and is as definite as it can be made and protect the invention. Neither is the advance made in the art one of degree merely; the alloy made within the proportional limits given being critically different in kind from those not so made. The patent also held infringed.

3. SAME—NOVELTY—PRIOR USE.

In order that a single prior knowledge and use of an invention may be enough to negative novelty in a subsequent patent therefor, it must be something more than an accidental or casual use, and it must be shown that such use was so far appreciated at the time and adopted or followed as to create a well-understood, if not an established, practice capable at any time of being resorted to, and not something incidental and fugitive which is hunted up and brought forward simply to defeat the patent.

4. SAME—PROOF TO ESTABLISH PRIOR USE.

The temptation in patent cases to resort to the defense of prior use to defeat the patent is always great, and parties are held in consequence to the most convincing and stringent proof, not only to the fact of such use, but to its character as well.

CONROY v. PENN ELECTRICAL & MFG. CO.

(Circuit Court, W. D. Pennsylvania, District Court. February 5, 1907. 155 F. R. p. 421.)

1. PATENTS—SUBJECT OF PATENTS—FUNCTION OF MACHINE.

The Conroy patent, No. 723,139, for a method of ornamenting glass, which consists in chipping and scalloping the edges of plate glass for small mirrors by the use of a machine, is void as merely being for the function of the machine in the manufacture of an old product; the same work having previously been done by hand and by practically the same mechanical process.

2. SAME—PRIOR USE—MACHINE FOR SHAPING EDGES OF GLASS.

The Conroy patent, No. 735,949, for a machine for shaping or chipping the edges of glass articles, discloses invention, and is not invalid for prior use because the machine was in fact used for more than two years prior to the application; it being shown that, while the machine was fairly successful, and its product was sold, the purpose of its use was experimental, and it was during such time being perfected by the inventor and was kept under lock and key and as far as possible from the knowledge even of the factory workmen who were not engaged in its operation. Also, held infringed.

CONROY v. PENN ELECTRICAL & MFG. CO.

(Circuit Court, W. D. Pennsylvania. Feb. 5, 1907. 155 F. R. p. 425.)

PATENTS — INFRINGEMENT — MACHINE FOR SHAPING EDGES OF GLASS.

The Conroy patent, No. 731,677, for a machine for ornamenting glass, by chipping the edges of plate glass, which is a modification of the machine of patent No. 735,949, to the same inventor, designed to be used in chipping circular or oval plates, makes a table, carrying the plate and having a step by step machine movement to present successive portions of the plate to the action of the single cutting pin, an essential element of each claim, and is not infringed by a machine having no such movable table, nor its mechanical equivalent.

AMERICAN GRAPHOPHONE CO. v. INTERNATIONAL RECORD CO.

(Circuit Court, S. D. New York. June 11, 1907. 155 F. R. p. 427.)

PATENTS—SUIT FOR INFRINGEMENT — PRELIMINARY INJUNCTION.

The presumption in favor of the validity of a patent created by a decision of the Circuit Court of Appeals sustaining it cannot be overcome on a motion for a preliminary injunction in a subsequent case, by ex parte affidavits relating to matters occurring several years previously.

AMERICAN GRAPHOPHONE CO. v. LEEDS & CATLIN CO.

(Circuit Court, S. D. New York. June 11, 1907. 155 F. R. p. 427.)

1. PATENTS—INFRINGEMENT—TALKING MACHINES.

The mere making of duplicate copies of fully finished commercial foreign-made records for talking machines does not constitute infringement of a patent for a machine in which such records are adapted to be used, and in which they constitute an element of the patented combination.

2. SAME—SUIT FOR INFRINGEMENT — PRELIMINARY INJUNCTION.

Preparations or threats to infringe a patent shown by ex parte affidavits only are not sufficient to warrant the granting of a preliminary injunction.

PRINDLE v. BROWN et al.

(Circuit Court of Appeals, First Circuit. August 2, 1907. 155 F. R. p. 531.)

1. PATENTS—REMEDY IN EQUITY FOR REFUSAL OF PATENT—SCOPE.

The broad scope of Rev. St. § 4915 [U. S. Comp. St. 1901, p. 3392], authorizing a suit in equity to establish the right to a patent, was in no way limited or qualified by Act Feb. 9, 1893, c. 74, 27 Stat. 434 [U. S. Comp. St. 1901, p. 3391], providing for appeals from the decision of the Commissioner of Patents to the Supreme Court of the District of Columbia.

2. SAME—SUFFICIENCY OF BILL.

A bill filed under Rev. St. § 4915 [U. S. Comp St. 1901, p. 3392], to establish the right of complainant to a patent which alleges that "before the sixth day of June 1900" complainant "was the true, original, and first inventor" of the device in issue, that on that day he filed his application for a patent therefor, and that on May 28, 1900, defendant filed an application for the same invention on which after interference proceedings he was awarded a patent, is not fatally defective on general demurrer.

3. SAME—ALLEGATION OF DATE OF INVENTION.

A bill which states the date of an application for a patent is not to be held to state that the invention was then first completed or reduced to practice unless nothing is alleged showing invention prior thereto, and a further allegation that the invention was made prior to such date covers the fact of reduction to practice, and is sufficient to carry the date back of the application.

MAUNULA v. SUNELL.

(Circuit Court, D. Oregon. August 12, 1907. 155 F. R. p. 535.)

1. PATENTS—INVENTION AND INFRINGEMENT—NET LEADER.

The Haataja patent No. 587,308 for a net leader covers a new combination of old elements, which produces an old result in a more facile, economical, and efficient way, and discloses patentable invention as contradistinguished from mechanical skill, also held infringed.

2. SAME—EVIDENCE OF INVENTION.

The fact that there existed a mechanical requirement for a machine to do a certain thing for a long time, which was first supplied by the machine of a patent, is highly evidentiary of inventive application and genius.

3. SAME—INFRINGEMENT—USE OF EQUIVALENT PARTS.

The inventor of a combination is himself entitled to apply and adapt the equivalents of the parts to his own use, and his patent covers any alterations which are formal, and adapted to perform the same function in substantially the same manner as fully and effectively as the parts described.

4. SAME — EQUIVALENTS — IMPROVEMENT PATENT.

If a patented improvement is of great utility and denotes a marked and signal advance in the state of the art, although not entitled to be denominated a pioneer, the law accords to the inventor a larger range of equivalents than it does where the improvement is of lesser or minor importance.

5. SAME—CONSTRUCTION OF CLAIMS-ERROR IN DESCRIPTION.

Under the rule that language of a patent should be so construed as to save rather than destroy it, a claim in a patent of "rotatably mounted bars * * * substantially as described" as an element of a combination is not void because the specification and drawings show a rotatable and a fixed bar, there being no doubt as to the thing intended.

THOMPSON v. AUTOMATIC FIRE PROTECTION CO. et al.

(Circuit Court, E. D. New York. August 7, 1907. 155 F. R. p. 548.)

SPECIFIC PERFORMANCE — SUFFICIENCY OF BILL.

A bill for specific performance of a contract by one of the defendants, to assign to complainant a patent for an invention alleged to have been made by such defendant while in the complainant's employment, the application for which patent he had assigned to his codefendant, held, on demurrer, to state a cause of action.

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The Working of Our Patent System.

There has been of late years so much talk about the iniquity of trusts, and so much popular feeling against combinations that tend to restrain trade, that it will surprise most of us to realize that there is a monopoly which is received with sanction by the courts, which can be acquired by anyone, and which is highly favored by the law. This is a monopoly afforded by a patent.

Before this system of protection was instituted, inventors were obliged to keep the products of their brains secret, if they hoped to profit by them. The efforts made in bygone times to ferret out trade methods read like romances. The history of cast steel offers a curious instance of how one secret of manufacture was stolen. The chief difference between iron and steel, as everyone knows, is that the latter contains carbon. The one was converted into the other by being heated for a considerable time in contact with powdered charcoal in an iron box. Steel thus made, however, is unequal and unreliable, and a watchmaker of Sheffield, England, a century and a half ago, became dissatisfied with the quality of the watchsprings in use, and determined to make them homogeneous. He succeeded in making cast steel, and his work was soon in general demand. A large manufactory was established, and the process was wrapped in secrecy, only faithful employes being hired. But one bitter winter night a traveler begged for shelter, and was permitted to enter and sleep on the floor. The next day the secret was known to the world. In a similar way, the method of making citric acid was found out by a clever chimney sweep, who waited until the chemist who discovered it had locked his shop and gone home, and who then dropped down the flue into the laboratory and examined the details of manufacture. Many tragedies resulted from attempts to steal trade mysteries. The history of Venetian glass is marked with blood. The inventor could keep secret only such inventions as could be practiced in secret. A new article or machine, as soon as sold, could be copied by a rival, who would be saved the trouble and cost of the original experiments as to its design. There was thus no incentive to make inventions, and the secret often died with the originator and was never found again. For these reasons both the public and the inventor profit by the modern patent system, which gives the inventor an absolute monopoly for a period, in consideration of a full disclosure to the public after the expiration of that time.

The peculiar character of this monopoly was discussed in an interesting manner before a trade society of Orange, N. J., a few months ago, by Edwin J. Prindle, of the New York Bar. The monopoly, he explained, is negative in character. It grants the right to exclude all others from making, using or selling the invention, and for this reason, the wording of the grant has a curious effect. The measure of the grant is termed the "claim," because it is a statement of what the inventor claims as his invention of all the machine or other subject matter which it is necessary to illustrate in the patent as an embodiment of his invention; for every invention, consciously or unconsciously, is an evolution of some earlier form. The strange thing about a claim is that the more it says, the less it embraces. The point was illustrated by likening a claim to a bill of sale for cattle on a Texas ranch. If it purported to give title to "all the short-horn Durham steers with one white foot and three black ones," it would convey perhaps only two or three steers, while if it said simply "all the live stock," it would convey all the steers of every kind, as well as horses, pigs and sheep. So the less a claim says, the more comprehensive it is.

The protection which a patent affords was illustrated by supposing a patent to have been granted for a device in bicycles, and a competitor to have tried to appropriate the invention under a disguise in form. It was shown how a court would have applied the equitable "doctrine of equivalents" to enjoin the competitor and make him pay damages and profits, if the patentee had not put it out of the court's power by too great limitations in his claim. Under the monopoly granted by a patent, an inventor may grant to a manufacturer the right to make the machines for him, but may reserve to himself the exclusive right to sell them. He may make restrictions as to territory, or as to the price of articles to be sold. The court, for example, decided that it was lawful for the Edison Phonograph Company to require its licensee in New York not to sell phonographs below a certain price. It was recently held lawful for a patentee in rubber tires to license most of the rubber tire manufacturers in the United States under his patent, to require them not to sell below a certain price, and to require them to form an association to protect the interests of the patent—a combination which, but for the fact that it was under a patent, would have been a combination in restraint of trade under the famous "Sherman Act." To quote from a recent legal decision, "Within his domain, the patentee is Czar." The courts have has been most liberal in dealing with the grant of patents. One-tenth of the time of the U. S. Courts is devoted to this subject alone. Most of our great manufacturing companies are founded on patents—witness the case of the Bell Telephone Company—and the more important ones employ corps of inventors to keep their products ahead of the market. Because the operation of the patent laws, like that of the laws of nature, is unobtrusive, few of us appreciate the fact that they have been one of the most essential elements in the development of our country from a few non-manufacturing colonies to the greatest of manufacturing nations.

Power from the Sun.

Harnessing the sun is the latest means of obtaining power from nature. Many experiments have been made looking to the utilization of the heat from the sun, but most of them were expensive, involving the use of mirrors and lenses to concentrate the rays. But now comes a machine that consists merely of a big hot box, on the principle of the common hot-bed used by florists and farmers—a wooden frame, 18 x 60 feet, sunk into the ground and covered with a double top of hot-house glass, with an inch of air space between the layers. Below this coating of glass are coiled iron pipes, painted black, from which the inventor derives his power. These pipes are filled with ether and connect with an engine. The circuit is scientifically designated as a "closed" one, and the ether in the pipes is converted into vapor in the hot box, passes through the engine, developing the power of the machinery, thence into the condenser and back again into the hot box. Entire reliance is placed on the heat of the sun to convert the liquid into vapor, and no other fuel is demanded to make this possible. In tropical climates, water may be substituted for ether in the pipes. The economy of the idea is obvious.

This machine, which has been tried in Philadelphia, has been found to develop a temperature of 240 degrees. In warmer latitudes, the apparatus should be found to be very useful. It is intended to erect a large engine in Florida this spring. It is thought the engine will be especially available for pumping water for irrigation. As long as the sun shines the pumps will work, and whatever water is drawn from the depths of the earth will be free of cost, with the exception of lubrication, the interest on the investment and the extremely small cost of attendance. One man on horseback will be able to attend to 50 small pumping stations. It is not unlikely that our Western American desert may be made productive through this agency, at a small cost. Much interest has been manifested in this machine; the U. S. Weather Bureau is about to test a plant in Washington. Negotiations are also under way for the operation of a trolley system by a solar plant in Egypt. It is further suggested that the solar engine could be used in making liquid air, the cost of running the machine being so little. All scientists recognize that a great field of usefulness is open to liquefied air, if a cheap method of producing it can be found.

Another Monorail.

The question of congestion in large centres of population can be solved only by rapid transit. Many efforts to achieve this end have been made, and it is generally realized that the ordinary railway will not answer the purpose. For this reason interest has been aroused in a new railway system devised by an Englishman named Kearney, which offers an ingenious development in accelerated railway transit. The idea is modeled on the monorail, which has already been described in these columns, with this essential difference: in addition to the single rail there is a rigid overhead line of lighter construction, with which overhead wheels engage, serving to hold the car in an upright position. The two tracks are held in alignment and gauge by semi-circular supports, the ends of which grip the bottom and upper rails respectively, so that one cannot move without the other. The car itself is mounted on four or eight wheels as desired, the wheels being mounted one behind the other in pairs, upon bogie trucks at either end. Each wheel is a driver, since it carries upon its axle and coupled directly thereto an electric motor. By this arrangement the greater part of the weight of the car is near the track, the superstructure containing passenger accommodation being relatively light, so that the centre of gravity is placed very low; and this factor alone almost serves to keep the car upright, so that little pressure is brought to bear on the guide rail by the overhead wheels, which latter are mounted tandem fashion on the roof of the car, also at either end.

When the car is in motion, owing to the gyroscopic action produced by the traction wheels, pressure on the top rail is practically absent. The secret of the invention lies in the design of the guide wheels, which are cut very deep, and in such a manner that rubbing friction is reduced to a minimum. The advantages of the arrangement lie not only in the very high speed attained—from 100 miles an hour upward—but in the smoothness and steadiness of travel. Since there is only a single rail, lateral swaying is obviated. The device is safe, since derailment is impossible unless the permanent way has actually become broken. Curves can be easily negotiated at a high rate of speed, as it is only necessary to tilt the guide rail to give the car an inward leaning to counteract centrifugal force. Railway construction on this principle would be relatively cheap, since the line could simply follow the contour of the country, avoiding cuttings and embankments, and gradients up to one in three could be successfully traversed.

The Helion Lamp.

One of the most recent additions to the already numerous family of incandescent electric lamps is the helion. The distinctive feature of this lamp lies in its filament, which is formed by the deposition of silicon upon a carbon core and which, in operation, gives off a white light closely resembling that of the sun. The helion filament is thicker and stiffer than that of the ordinary lamp, but in spite of this, its resistance is so great that only a short filament is required. Its most remarkable characteristic, however, is that it can be burned in air without immediate destruction, although the best results are obtained by burning it in a vacuum bulb.

Umbrella Tags.

There is probably no more elusive article than the umbrella, the loss of which at one time or other almost every one has experienced. The commonest form of loss is to leave it accidentally in a vehicle or a shop. An ingenious invention has been devised which will render such misplacement impossible, and will also prevent the difficulty of identification on the part of the owner when the missing article is found. It consists of a small tablet let into the handle of the umbrella, bearing the owner's name and address, and hidden from view by a slide. While of course this contrivance will not be proof against the practices of the light-fingered gentry, it should serve to diminish the heavy loss, aggregating thousands of dollars yearly, arising from forgotten or misplaced umbrellas.

Automatic Money Assorter.

A machine that will sort money automatically is described in a recent issue of an Austrian newspaper. It is claimed that it will sort metal coins which have been thrown together regardless of their denominations. The various pieces of money are tossed indiscriminately into a funnel, down which they slide, alighting on a spiral track. This track has a protecting edge or raised border containing slits corresponding to the various sizes of the coins. As the coins glide onto the track, by means of a special device they pass through the slits corresponding to their various sizes, and enter separate baskets at the bottom of the machine. It is said that several firms handling large amounts of coin daily have tried the machine with satisfactory results.

Rescuing Miners.

A school for the education of mine rescuers has been established in the heart of the coal district of England. The plan is to make tests of all the various pieces of apparatus which are brought out from time to time, and to instruct men for the work of scientific mine rescue. Part of the equipment consists of a miniature mine, where all the conditions of a colliery after an explosion or other form of mine accident can be reproduced. The men are sent out into this place to work under trained supervision. The air is at times filled with poisonous fumes, and the students are obliged to work in semi-darkness, repairing and tearing away. They are compelled to carry a dummy figure weighing about 150 pounds, which is supposed to be the form of an injured workman. As the students become proficient in the work they are to be sent to different mining districts, and held in readiness for a call to service.

Steel Belts.

The use of steel bands to take the place of leather belting for the transmission of power has been tried and proved practicable. The new belting is described in a report from our consul at Magdeburg, Germany, and he adds that the points of superiority claimed are the following: On account of its solidity, a much narrower band can be used, one-sixth of the width of the usual leather band being sufficient. As a result of this, the steel band is not so heavy as the usual leather band, and since it can be very tightly adjusted, the distance between the engine and the machine is not a matter of importance, as is the case with the leather belting, where the transmission of power is dependent upon the weight of the hanging belt. Further, the slipping is much reduced by means of an unique contact, experiments having shown that this does not exceed one-tenth of one per cent. The entire loss of power is very small, and owing to the lightness of weight of the steel belting, the influence of centrifugal force is not so great, which permits a much greater velocity.

Wireless Lighting.

It has long been known that an electric current passed through an exhausted tube would produce a vivid light. This knowledge has now been turned to commercial account. In several places in New York long tubes extend around a room or hall, throwing off light which, being better distributed, is superior to the incandescent or arc lamps. These tubes contain a rarified gas. A drawback has been found, however, in the fact that after the electric discharge has been passed through the tube for a time, the pressure decreases; the gas seems to become absorbed, and the light diminishes. This is now overcome by the use of an automatic valve, through which the vacuum tube replenishes its supply of gas from an outside reservoir. The valve is controlled by the pressure on the tube itself, for as the vacuum tends to become higher, the pressure from the outside increases. The device works admirably, and nitrogen is the gas generally employed. Carbon dioxid can also be used, and although it does not have the same efficiency as nitrogen, it possesses the remarkable power of revealing tinted surfaces in daylight colors, so that the artists can work by it about as well as in sunlight. The vacuum tube is more economical than many other forms of lighting, as it requires no interior wiring, and therefore costs relatively little to install.

Building a Balloon.

Undiscouraged by the accident to his last monster airship, Count Zeppelin is busily engaged in the construction of another. In fact, plans for this last balloon were made months before the final flight of his fourth vessel. An English firm has been entrusted with the task of making the fabric for the fifth balloon, and a number of girls in the factory are preparing the goldbeaters skin from which it is to be made. The envelope will be composed of six layers of the skin, and by a secret process, the skins are so joined together that no seams are visible, and the finished fabric combines extreme lightness with an extraordinary degree of toughness. The cells, or gas holders, of the balloon are being built like a very large drum and are divided into fifteen sections, each being self-contained. The holding capacity of these will be 40,000 cubic feet, so that the whole airship (600,000 feet) will be considerably larger than the fourth balloon. There will be sufficient room for the inflation of each section separately. When finished, the sections will be packed carefully and sent to Germany to be fitted into the rigid framework of Count Zeppelin's airship.

Goldbeaters' skin is the strongest material for its weight that can be found. It is the first time that Count Zeppelin has employed it in the construction of balloons, he having relied hitherto upon an india-rubber covered fabric, which, though cheaper, is three or four times heavier. It is estimated that the skins of about 600,000 cattle will be required before the work is finished.

The Bessemer Converter in Salt Manufacture.

Efforts have been made for years to evolve a more expeditious and a cheaper process for the manufacture of salt than the method of evaporation which has been in vogue so many centuries. By this time-honored plan, rock salt quaried in the mine, together with its numerous impurities, is discharged in water and the latter are subsequently driven off by means of fire beneath evaporating pans. A new process which has recently been put into practice may be described as the application of the Bessemer converter used in the manufacture of steel. Dirty rock salt is discharged into special furnaces and is quickly converted into a molten condition. Thence it is run into a receiver through which a current of compressed air is forced. This causes all the impurities in the molten mass either to be blown off into the air or to be precipitated to the bottom of the vessel, leaving an almost transparent liquid. The latter is poured off into molds and allowed to cool and solidify, the resulting product being pure and white, suitable for the market. The block obtained can be sold in this condition as rock salt, or it can be broken up and ground into various sizes as required for different purposes. The most prominent feature of this process is not only the elimination of impurities, but the fact that the salt is bleached. The extent to which the cost of manufacture is reduced by this method may be gathered from the statement that while by evaporation a ton of coal yields one and a half tons of salt, by the fusion process one ton of fuel produces fifteen tons of finished salt, ready for table use.

Preserving Eggs.

Since scientists have abandoned the idea of making artificial eggs as a commercial product, attention has been drawn to the preservation of real eggs for indefinite periods. Canned eggs, limed eggs, cold storage eggs, and eggs preserved in chemical compounds are now regular market products; but the most recent egg freak consists of hard boiled eggs preserved in clay and charcoal paste. This idea is derived from China. The Chinese have preserved boiled eggs in clay for a long time, and some are said to be centuries old. The eggs are boiled hard and wrapped in soft clay while hot. The clay hardens and looks like pumice stone. They are packed in bags and rice husks, and kept indefinitely. When opened the yolks are green and the white part almost black; but they retain a distinct egg flavor, and when chopped fine they flavor sauces and gravies as well as fresh boiled eggs.

Duck eggs are boiled and packed in a paste of charcoal, which hardens about them and forms a perfect protection.

Experiments are now being made in this country in the same direction, the object being to retain the natural color of the eggs. The character of the clay and charcoal is said to determine the darkening of the contents, dark, heavy clay preserving the white and yellow of the eggs better than light clay.

But of all the methods of keeping eggs, the simplest and cheapest is described in a recent bulletin issued by the Italian department of agriculture. A scientist of Italy, after reviewing the different processes of egg preservation, came to the conclusion that success depended upon adopting some system that would absolutely prevent the exchange between the air ouside and that inside the egg; for it is this continual exchange that causes putrefaction. He therefore selected perfectly fresh eggs and covered them with lard, so as to effectually stop up all the pores. The shells were thus rendered impermeable, the exchange of air was prevented and the obstruction of the pores not permitting the evaporation of water, there was no loss of weight. The yolks and whites retained their color and the taste was not modified, although some of the eggs were kept for a year. When properly coated with lard—not too thickly—the eggs are placed in boxes on a bed of fine shavings, so arranged that they do not touch. The room should be kept dry, but the question of temperature is not important. It is said that four cents' worth of lard is enough for 100 eggs, and that anyone can easily prepare that number in an hour's time.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies $1.50.—Please give correct data in ordering.—Address,

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Rocking-chair, Nursery.....A. D. Simmonds
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Roller-mill feed mechanism.....W. H. Smith
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Rubber sandal.....A. O. Bourn
Sad-iron.....J. M. Harper
Safe.....J. Baum
Safe or vault door.....E. A. Strauss
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Salt-cellar.....W. Bumm
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Scaffold-bracket, Self clamping.....F. H. Dettmann
Scale, 2 pats.....W. G. Templeton
Scale, Weighing-.....L. Jaenichen
Sea-wall.....F. O. Ray
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Self-playing instrument.....A. J. Bluntach
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Shade tool, Window-.....H. B. Kerr
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Sheet metal, Method and machine for stretching slitted.....F. J. Wendell
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Shoe polishing apparatus.....E. M. Scranton
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Steam-trap.....A. L. Riggs
Steamer, Grain-.....K. Wougan
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Stocking-suspender.....H. Dahms
Stone-polishing wheel.....M. Pembroke
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Stone veneer, Making artificial variegated.....J. Tully
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Street-sweeper.....L. A. Crozier
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Submarine operations, Apparatus for.....F. H. Jackson
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Suit-hanger.....E. L. Henderson
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Switch-points, Connecting-rod for..J. E. Lewis
Switch-throwing mechanism.....J. N. Fowler
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Tablet-machine.....E. L. Richards
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Telephone installations, Apparatus for.....C. A. Simpson
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Well-drilling apparatus.....R. D. Moon
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Window, Sliding.....J. Stumpf
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Wood and producing the same, Artificial grained or figured.....W. A. Hall
Wood, Coloring, 4 pats.....W. A. Hall
Wood for lumber, Treating.....W. A. Hall
Wrench.....M. E. Layne et al
Wrench.....T. A. Casey
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DESIGNS.

Badge.....J. P. Mullally
Badge.....B. Thompson
Badge or similar article.....O. W. Gray
Bag, Hand-.....L. Merzbach
Bicycle-frame.....F. C. Gilbert
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Air-compressor.....T. O. Perry
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Color combinations, Device for obtaining.....R. A. Simpkin
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Molding appliance ..... A. T. Rasmussen
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Molding process ..... W. F. M. McCarty
Motor and compressor, Combined ..... C. P. Tolman
Motor-control system ..... H. Alexander
Motor control, Induction ..... E. F. W. Alexanderson
Mower, Lawn ..... J. Watson
Muffler, Exhaust ..... J. M. Porter et al
Music-turner ..... J. H. Collier
Note-sheet-guide mechanism ..... F. W. Wood
Numbering-machine ..... I. Hasselstrom
Nut-lock ..... E. A. Hemsteger
Nut-lock ..... R. G. Burton
Oiler for vehicles, Automatic ..... F. T. Musso
Oils, Purifying petroleum ..... E. W. Wynne
Ordnance, Breech-loading ..... W. Y. Donahoe
Outlet-box ..... H. A. Coffin
Packing ..... J. Grant
Packing-pad ..... L. F. Flipse
Paint or varnish remover ..... C. Ellis
Pan-handle ..... A. Vincent
Paper holder, Roll ..... G. P. Burris
Paper, Manufacture of copying ..... A. and M. Pidelaserra y Brias
Paper perforating, cutting, and delivery apparatus ..... R. M. Davidson
Pen, Writing ..... W. H. Schweizer
Piano, Automatic ..... M. Clark
Piano, Automatic ..... F. W. Wood
Piano, Automatic grand ..... J. W. Darley, Jr.
Piano-playing attachment ..... J. E. Shoemaker
Piano, Self-playing ..... F. E. Ives
Piano-sounding-board bridges, Mechanism for notching ..... H. G. and A. F. Osterberg
Pianoforte ..... W. R. T. Hill
Picture card, Invisible ..... C. F. Morse
Pipe ..... C. S. Hamlin
Pipe holder, Smoke ..... G. C. Ehlers
Pipe-machine ..... G. A. Wettengel
Planing shoes and wedges, Mechanism for ..... M. Morton
Planter attachment ..... J. B. O'Brien
Planter market attachment, Corn ..... J. C. Liston
Plowing or otherwise cultivating the soil, Machine for ..... E. Ferriss
Plumbing connection, Sanitary ..... A. M. Morrison
Postal mailing-card ..... F. D. Ormston
Potato-digger ..... H. J. Frisse
Poultry-house ..... J. H. Irwin
Power-transmitting mechanism ..... H.R. Rice et al
Primary battery ..... K. Heintz
Pulley, Clutch ..... W. Duerr
Pump, Condensing-apparatus ..... J. Astrom
Pump, Multistage centrifugal ..... H. Keller
Pump, Rotary ..... P. Gauer
Rail-fastener ..... E. Stem
Rail-joint ..... F. J. Shelly
Rail-joint ..... P. P. Ragaller
Rail-joint ..... L. White
Rail-splice ..... C. M. Culp
Railway electric signaling system ..... W. J. Higgins et al
Railway safety apparatus ..... S. L. Adelson
Railway-signal, Electric ..... E. A. Everett
Railway-sleepers, Tool for cutting seats in ..... A. Collet
Railway-switch ..... I. M. Keltner
Railway-switch-operating device ..... G. M. Spalding
Railway system, Electric, 8 pats ..... W. Robinson
Railway-tie ..... J. A. Bergquist
Railway-tie ..... T. W. Welsh
Railway-tie ..... J. T. Spaulding
Railway-tie ..... J. W. Biller
Razor ..... A. Koscherak
Razor, Safety ..... M. Flynn
Receiver ..... J. S. Goldberg
Receptacle-closure ..... A. Rasmussen et al
Rheostat ..... P. H. Zimmer
Rocking-chair ..... J. Suva
Roll-cleaner ..... S. Coderre
Roller ..... H. Brubaker
Roost, Folding poultry ..... E. A. Eigler
Rotary engine ..... W. S. Moses
Routing-machine ..... R. Milne
Rug holder or stiffener ..... A. Danek
Sad-iron heater ..... H. W. Russel
Sad-iron heater ..... G. W. Fallin
Sash automatic closing attachment, Window ..... G. Schwing
Sash-balance ..... S. E. Parks
Sash-fastener ..... H. Atwater
Sash lifting and locking appliance, Window ..... T. E. Carter
Sash-lock ..... W. D. Rankins
Sash mechanism, Ventilator ..... F. D. Moon
Sash-weights, Chill for ..... W. G. Standing
Sash, Window ..... M. F. Holbrook
Saw for removing stumps ..... J. M. White
Saw-table safety attachment ..... E. W. Cummings
Scaffold-bracket, Safety ..... J. R. Watt
Scale, Beam ..... O. Jones
Scale, Platform ..... D. Lennox
Scenic effect ..... D. H. Leas
Screening-machine ..... G. P. and P. D. Burke
Self-lubricating wheel ..... H. Atkinson
Self-registering gage ..... M. S. Shapleigh
Sewer-cap, Artificial-stone ..... E. F. Kennelly
Sewing-machine feeding mechanism ..... E. F. Durand
Shade carrier, Window ..... A. C. Van Erka
Sharpener, Scissors ..... J. B. Carroll
Sheet metal, Cutting ..... A. Benson
Sheet-metal-cutting machine ..... A. Benson
Shelves and tables, Detachable auxiliary holder for ..... G. Eggl
Shoe ..... E. J. Lafond
Shoe for loggers, Safety ..... G. L. Clement
Sign-exhibiting device, Changeable ..... J. J. Metzger
Signaling device, Marine ..... M. Boyd
Signaling system, Selective ..... O. W. Hart
Skillet-support ..... H. C. Ebert
Skirt-marker ..... A. M. Sutton
Skirt-supporter ..... N. C. Edwards
Sled and brake therefor, Bob ..... E. G. Doland
Sleigh ..... E. Ferriss
Sleigh-runner, Attachable ..... J. E. Hobbs
Slicing machine, Meat ..... W. A. Van Berkel
Smelting-furnace ..... G. A. Wettengel
Smoking-pipe ..... W. R. Kaufman
Snow-storm, Device for producing the representation of a ..... E. C. Bruen
Sound-box ..... J. S. Kerr
Sound-reproducer ..... W. A. Chapman
Spark-arrester ..... A. Hall
Spindle-driving mechanism ..... H. Allen
Spinning and twisting frames, Appliance for cleaning the delivery-rollers of mule ..... W. A. Cordingley
Spraying apparatus, Liquid ..... H. L. Doherty
Spreading device ..... J. A. Birsfeld
Spring-wheel ..... J. F. Stannard
Stacker, Straw ..... E. G. Clemans et al
Stacker, Straw ..... E. G. Clemans et al
Stamp-mill tappet ..... M. P. Boss
Stamp, Time ..... F. Purdy
Stanchion, Cattle ..... F. Neumeister et al
Stay for garments and the like ..... J. R. Dean
Steam-engine ..... G. E. Riblet
Steering apparatus control mechanism ..... F. M. Leavitt
Stirrup ..... R. E. H. Johnson
Stock-fountain ..... E. E. Norquist
Stocking-supporter ..... T. Papworth
Stool, Folding ..... G. S. Hutchinson
Stop and waste, Reversible compression ..... W. G. Rozell
Store-fixture ..... J. M. Walker
Storing and display case ..... G. A. McNamar
Stove-lid lifter ..... A. Smith
Strainer, Butter ..... H. Dixon
Strip-feeding mechanism ..... C. E. Brooks
Structure, Reinforced ..... D. W. Norton
Stud, Lacing ..... L. B. Davis
Supervisory system ..... M. S. Conner
Surgical table ..... S. M. Langworthy
Swings, benches, &c., Anchor and base-plate for lawn ..... A. W. H. Weber
Switch-box, Universal ..... W. M. Brown
Switch-point retaining device ..... A. R. Murray
Switch-stand ..... H. S. Goughnour
Switch structure ..... H. C. Stiff
Switch structure ..... H. S. Goughnour
Switchboard ..... M. S. Conner
Switchboard jack, Multiple ..... J. A. Birsfield
Table ..... H. Kardos
Tablet-forming machine ..... B. W. Scott
Talking-machine ..... W. A. Chapman
Tanning-ooze ..... G. A. Sweetman
Tape-reel, 2 pats ..... P. Ferber
Telegraphic sounder ..... V. C. de Ybarrondo
Telegraphone principle, Apparatus for recording and reproducing by the ..... H. R. Stuart
Telegraphy ..... L. M. Potts
Telegraphy, Space ..... O. C. Roos
Telephone-call indicator ..... E. T. Ducharme
Telephone-circuit, Subscriber's ..... H. M. Post
Telephone-exchange system, 4 pats ..... M. S. Conner
Telephone-exchange system ..... W. M. Davis
Telephone-exchange system, Automatic ..... B. G. Dunham
Telephone-exchange system, Multiparty-line ..... G. Babcock
Telephone-receiver holder ..... G. J. Thomas
Telephone system ..... E. R. Corwin
Telephone-transmitter ..... M. S. Conner
Telephone-transmitter protector ..... J. Baumgarten
Telephonic transmitter ..... F. G. Warrell
Tent ..... F. H. Gotsche
Thread-counting apparatus ..... A. and L. Chronik
Threshing-machine feeder, Pneumatic ..... C. W. Sellers
Tick-tack ..... W. H. Davis
Tile, Drainage and irrigation ..... N. E. Austin
Time-register, Watchman's ..... A. A. Newman
Timepieces, Attachment for ..... F. Paquette
Tin can ..... M. E. Dunkley
Tinning apparatus ..... W. I. Hill
Tire-cover and fastening means therefor ..... I. J. D. Fairhurst
Tire-cover, Antislipping ..... I. J. D. Fairhurst
Tire cover, Pneumatic ..... I. J. D. Fairhurst
Tires, Grip-tread for pneumatic ..... B. H. Sills
Toy ..... E. V. Wetzel
Tracks, Transfer for overhead ..... W. Louden
Trap ..... A. O. Thompson
Tray ..... O. Hebestreit
Trolley-harps, Electric contact-spring for ..... A. L. Cole
Trolley-wheel bearing ..... W. M. Caswell et al
Trolley-wire anchor ..... A. McIsaac
Truck ..... B. S. Gillum
Truck, Car ..... R. Smith et al
Tube-cleaner, 2 pats ..... K. O. Sandström
Tunneling-machine, Rotary ..... R. B. Sigafoos
Turbine ..... A. J. Rowan et al
Turbine ..... S. Z. de Ferranti
Turbine-bucket cover ..... A. F. Macdonald
Turbine bucket-wheel ..... W. L. R. Emmet
Type-case ..... J. R. Rankin
Type-writer cabinet ..... J. Metzler
Type-writer table ..... C. E. Kingston
Type-writing and printing machine, Combined ..... W. H. Collier
Umbrella-holder ..... A. A. Stutsman
Universal coupling ..... G. A. Anderson
Valve, Ball-cock ..... E. G. Watrous
Valve-controlling means ..... J. W. Kenevel
Valve-controlling mechanism for internal-combustion engines ..... H. M. Neer
Valve, Flushing ..... T. F. Payne
Valve, Flushing ..... W. H. Bowman
Valve, Piston ..... H. S. Sprague
Van, Moving ..... A. B. Yetter
Vault-doors, Mounting for heavy ..... G. L. Damon
Vault-ventilator, Movable ..... F. S. Holmes et al
Vaults, Mold for making burial ..... T. M. Cass
Vehicle-brake ..... J. K. Kendrick
Vehicle controlling mechanism, Power-driven ..... C. W. Willette
Vehicle-frame ..... C. J. Pembroke
Vehicle-springs, Brace for supplementary ..... W. Young
Vehicle-springs, Steadying device for supplementary ..... W. Young
Vehicle steering mechanism, Self-propelled ..... C. B. Hatfield
Vehicles, Differential gear for motor ..... C. J. Pittman
Vessels, Means for transporting ..... E. L. Burwell
Washboards, Soap-holder for ..... V. B. Adams et al
Washing apparatus, Clothes ..... M. J. Baker
Washing-machine ..... D. McMannama
Watches, Roller for ..... J. Schoop
Water-closet ..... G. M. Depew
Water-closet ..... E. G. Watrous
Water-closet apparatus ..... W. U. Griffiths
Water-closet ball-valve ..... T. F. Payne
Water-closets, &c., Automatically-closing valve for flushing ..... W. H. Bowman
Water-cooler ..... G. A. Turner
Water-purifier ..... H. Korten
Water-trap ..... F. W. Meier
Watering device, Stock ..... F. E. Williamson

Wave-motor....T. H. Settle
Wedge-cutter....L. W. Rouland
Weed-puller....G. N. Nelson
Well plug, Gas-....W. F. Burgess
Welt-beater....J. J. Heys
Wheel....H. M. Verplanck
Wheel....A. L. Jiminez
Wheels, Detachable shoe for self-propelled-vehicle....W. P. Shattuck
Winch....V. W. Mason
Window-chair....H. J. Frey
Window-screen....E. Carney
Wire stretcher and splicer....H. F. Bonesteele
Wood and making same, Preserved....P. C. Reilly
Woodworking-cutter, Rotating....C. F. La Follette
Work-holder....C. M. Deems
Wrench....C. R. Olberg
Wringer....S. C. Lawlor
Writing and similar instruments or tools, Holder for....W. Kunde
Yoke center, Neck-....C. Lukasiewicz

DESIGNS

Automobile-hood....W. S. Sherman
Axle casing, Rear-....R. Huff
Bottle....D. Taylor
Emblem....L. J. Fox
Grinding-mill standard....C. N. McLaughlin
Knife, spoon, or similar article....G. Strobhaker
Range, Gas-....W. M. Crane
Ring, or similar article, Finger-..J. A. De Luisi
Screen, Closet-....J. W. Kelly
Seat end....E. G. Budd

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Acetylene-generator....E. E. Taggart
Acid, Apparatus for treating oleic....P. Schwoerer
Acid, Celestin-blue sulfonic....W. Lommel
Acid, Producing phosphoric....F. J. Maywald
Adding-machines, Printing-eliminating device for....C. Wales
Addressing-machines, Town-marker for....S. C. Cox
Air-brake quick-action automatic release mechanism, 2 pats....J. E. Normand
Air-brake systems, Valve mechanism for railway....J. E. Normand
Air-brakes, High-speed-reducing valve for....W. V. Turner
Air-brakes, High-speed-reducing valve for....W. V. Turner et al
Air from siphons of sluices and the like, Device for exhausting....C. Havestadt
Alternator, Inductor magneto....L. Le Pontois
Aluminous materials, Treating....L. E. Saunders et al
Amusement apparatus....C. H. Gueritey
Anchor, Vessel-....W. I. Babcock
Animal-bench, Folding....R. C. Rathborne
Animal-catcher....C. B. Cruse
Animal-trap....J. Shepherd
Annealing-furnace....E. E. F. Creighton
Arc lights, Carbon pencil of electric-....J. Nicholson
Ash-receiver....J. Voska et al
Auger, Post-hole....H. Hermanns
Automatic gate....A. T. Lister
Axle-bearing....C. M. Doritty
Axle-skein....S. K. Dennis
Baking-pan, Sanitary....W. H. Perry
Ballot-box, Computing....C. A. Ball
Balls, Manufacture of tennis and similar playing....F. Rowley
Band-cutter and feeder....E. M. Kramer
Band-cutter and feeder....W. J. Footitt
Barrette or hair-retainer....J. W. Nichols
Bedstead corner-fastener....A. E. Irelan
Bedstead, Metallic....C. Netzel
Bell, Electric....C. H. North
Belt....G. Fouillaron
Belt attachment, Link-....J. Eklund
Belt-coupling....D. Chase
Beverage cooling and dispensing apparatus....F. G. Schneider et al
Bilge bodies, Shaping....R. W. Hardie
Billiard-table and the like....F. Hepton
Binder, Loose-leaf....W. M. Wheildon
Blacking machine, Shoe-....W. C. Ford
Blower or compressor, Rotary....O. P. Ostergren et al
Boats, Davit-supporting means for sharp-stern....J. E. Robbins
Boiler-furnace....J. R. Surrell
Boiler-tube cleaner....E. J. McCarty
Bolt and latch releasing device, Door....L. Jones
Bottle, Vacuum-....P. O. E. Friedrich et al
Box....M. H. Doyle et al
Box-clamping machine....J. B. Ireland
Box-fastener....W. G. Long et al
Box-making, Work-holder for..W. H. Holland
Brake-cylinder, Duplex....W. V. Turner
Brake-hanger, Non-chattering....W. Dalton
Brake-shoe....S. P. Bush
Brake system, Fluid-pressure...W. H. Sauvage
Breech mechanism....S. A. S. Hammar
Brooch....C. N. Bruzaud
Burglar-alarm....C. A. Metzger
Bushings, Device for extracting....G. M. Coursen
Cable-tip....L. Kellner
Calculating-machine....E. Leder
Calculating-machine for money and similar objects....M. G. Fröberg
Calculating-machines, Power-transmitting mechanism for....C. N. McFarland
Calendar....J. Ferreres
Calipers, Micrometer-, 2 pats..F. O. Jaques, Jr.
Canceling device, Hand....H. R. McFarland
Car-body....W. H. Heulings, Jr., et al
Car brake, Railway-....S. A. Crone
Car-coupling....H. H. Paulson
Car-fender....D. E. Conn
Car gate, Passenger-....W. H. Heulings, Jr.
Car grain-door....J. Edman
Car guard-rail, Passenger-....S. T. Bole
Car-mover....C. H. Shotwell
Car, Passenger-....S. M. Curwen et al
Car, Passenger-....H. Howson
Car, Passenger-....R. H. and M. E. Moore
Car safety appliance, Street-....L. M. Maxham
Card-making machine....A. L. Hemphill
Carriages, Umbrella-support for....J. C. Williams et al
Carrier system....J. J. Meyer
Cattle-guard gate....J. Adams
Centrifugal separators, Flexible neck-bearing for....C. A. Edlund
Chain, Drive-....W. F. Brown
Chain-wrench....A. M. Tilton
Chalk-holder....H. T. McCune
Chuck....P. A. Whitney
Cigar-box and lid....W. J. Farrell
Cigar-cutter....E. Salzer
Cigar-cutter and match-deliverer....E. Salzer
Cigar-holding receptacle....J. P. Bergeron
Cisterns, Ventilating-cover for....J. U. Gribben et al
Clutch, Friction-....M. L. Williams
Cock-coupling....E. Witzenmann
Coffee after the same has been graded, Mechanism for cleaning and finishing ground....F. Conner
Coin-controlled lock....F. W. Kassler
Coke-drawer....R. L. Martin, Jr., et al
Collapsible stand....J. W. Kline
Column....C. T. Cunnius
Column-base....G. L. Preacher
Commode....L. W. Price
Commutator for dynamo-electric machines....F. H. Loring
Compasses, Drawing-....G. Schoenner
Concrete construction....R. T. Brown
Concrete construction....F. Melber
Concrete structures, Reinforce for....J. M. Sherwood
Conduit....J. A. Garey
Confectioner's box....C. E. Hawxhurst, Jr.
Container....F. B. Davidson
Conveyer....W. K. Liggett
Conveyer....C. O. Gustavsen
Cooking utensil....F. Robinson
Cooking utensil....H. Tidow
Core-box....A. H. Kudlich
Corn-sheller....W. H. Holsclaw
Cotton-chopper....J. T. Hamilton
Cotton-chopper....W. D. Lindsley
Cotton chopper and cultivator....J. H. Dunn
Cotton-picking finger....T. J. Gray
Crate, Collapsible....H. C. Hunter
Cultivator....J. W. Osborne
Cultivator, harrow, and rake, Combined....A. Benton et al
Cultivator harrow attachment....G. Trompeter
Culvert, Reinforced cement....C. D. Voris
Current-collecting means....C. Macmillan
Curtain-fixture....F. L. Egbert
Cut-out box....T. O. Andrazyk
Damper....W. D. Luce
Dental apparatus....F. Armstrong
Dental finger-tray....J. G. Powell
Differential mechanism....E. Aze
Dike, Movable....J. A. Cameron
Dish-washer....C. W. Fetherolf
Door and gate hanger....H. Todd
Door-hanger track....H. L. and H. J. Ferris
Door lock, Sliding....W. F. Bentley et al
Dough-cutting machine....C. J. Kintner
Draft-rigging....W. D. Lowry
Drain and backwater trap, Floor-...W. Weiler
Drain inlet, Tile-....H. N. Neireiter
Drawers adjuster and supporter....E. H. Wood
Drawers-supporter....E. H. Humphrey
Drill....F. E. Snyder
Driving and driven members, Safety-coupling for....F. H. French
Driving mechanism, Flexible....W. Dalton
Drum-beating apparatus....E. E. Pettingell
Dye and making same, Black sulfur....G. E. Junius
Dye, Azo....P. Volkmann
Dyes containing fatty acid radicals, Making azo....N. Sulzberger
Dyeing apparatus....H. Anner
Electric cell....G. Schauli
Electric conductor carrying current, Method of and means for utilizing the pressure in the interior of an....E. F. Northrup
Electric controlling device....H. W. Leonard
Electric fixture....E. C. Suiter
Electric heater....E. Thomson
Electric machine, Dynamo-, 2 pats....K. Sulzberger
Electric machine, Dynamo-....A. B. Field
Electric sparking device..W. H. R. Mildebrath
Electrically-controlled lock....E. W. Marvel
Electrode for arc-lamps....W. R. Whitney
Electropneumatic brake....W. V. Turner
Electrotype-molds, Preparation of....A. W. Harrison
Electrotype-molds, Solution for treating....A. W. Harrison
Elevator....S. Bruce
Elevators, Guide-greaser for....T. F. Goodrich
End-gate, Wagon....W. H. Palmer
Endoscope....R. H. Wappler
Engine-starter....L. S. Tuttle
Engines, Electric-circuit controller for internal-combustion....C. Cuno
Envelop....H. L. Staley
Envelop....J. A. Cheape
Envelop-machine....F. F. Flagg et al
Envelop, Safety-....I. Klein
Esters from solutions, Separating cellulose....L. Lederer
Explosives, Machine for mixing, 2 pats....H. Auchu
Facial expressions, Device for making....F. Ruple
Fan for cradles....N. Gordon
Fan or pump, Centrifugal....M. G. Hubbard
Fare indicator and register for vehicles....B. Schneider
Feed-cutter....I. and I. N. Gardner
Feed-water heater....L. H. Caverly
Feeder, Boiler-....N. English
Feeder, Chicken-exercising...A. and W. Bruhn
Fence machine, Wire-....W. W. Lincoln
Fence-post....A. M. Weatherly, Sr.
Fence, Wire....A. Westerberg
File, Card-index....O. W. Helbig
Filing device....J. D. D. Mortimer
Filter....V. Tonninetti
Filter-basket....F. J. Wood
Filter and water-cooler....J. Havassy
Film-holder....G. Logan
Fireplace, Electric....A. D. Rathbone
Fireproof attachment for vaults....T. M. Brintnall et al
Fireproof construction....A. P. S. and P. Wohlpart
Fishing-pole....P. Piper
Floor-dressing machine....W. S. Haven
Floor surfacing and polishing machine....E. F. Murdock
Flue-cutter....C. J. Crowley
Fluid-controlling means....F. P. Stevens
Fluid-pressure apparatus, Automatic regulating device for....A. C. E. Rateau
Folding table....W. R. Montgomery
Folding chair....T. M. Painter
Folding chair....J. C. Bennett
Food-dispensing apparatus, Coin-controlled....M. Woodbury et al
Foot-rest, Extension....W. E. Latimer
Furnace....J. F. Monnot
Furnace-grate and fire-bar....R. Campbell
Furrowing-machine....W. Flentje
Gambrel, Hog-....P. L. Brooks
Game apparatus....N. W. Smead
Game-board....M. Christopherson
Game-piece....F. Wallstein
Game-register....E. O. Parker et al
Garbage-collecting vehicle....A. G. Sharp
Garden implement, Multibladed....D. Voshell
Garment....A. Holste
Garment-hanger....E. W. Hawley et al
Garment-hanger....R. C. Thomas
Garment-supporter....C. F. Hyltén-Cavallius
Gas engine, Explosive-....A. E. Remick
Gas-mains, Automatic device for operating water seals for....L. Shaw
Gas-producer....C. H. Morgan
Gas-producing apparatus for extinguishing fires and other purposes....H. N. Williams
Gas-regulator....A. T. Newman
Gate....F. M. Neff
Gear, Speed-changing....W. C. Mayo et al
Gearing, Change-speed....H. Kupferschmid
Glass-making apparatus....J. Campbell
Glasses, Detachable handle for....R. R. Kintz
Globe-suspending device....T. H. Costello
Governing mechanism..W. L. R. Emmet et al
Governor....A. Davis
Granular material, Sampler for....H. D. Bonnell
Graphoscope....A. A. Felix
Grate and air-heater, Combined....A. D. Rathbone
Greenhouse construction....W. H. Lutton
Gutters, Making....H. E. and H. K. White
Hammock-stand and awning....P. King
Harness attachment....E. A. Nelson
Harrow....A. E. Diesem
Harrows, Safety-shield for disk....C. E. McMillan
Harvesting device, Corn-...V. R. McDole et al
Hat-rack and kneeling-stool for pews, Folding....F. X. Aumann, Jr.
Headlight-deflecting mechanism, Automatic....J. J. Shipley
Heating apparatus, Steam-....M. F. Smith
Heating system....E. T. Greenfield
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Hinge-clamp....R. V. D. Stoutenburgh
Hitching-weight holder....H. H. Tothill
Hoe....J. S. Lester
Hoeing-machine....C. Bongartz
Hoisting and conveying mechanism....W. M. Myers et al
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Hoisting device, Automatic....E. E. Barrett
Hook and eye....V. E. Morse
Hose-making machine....J. S. H. Lovett
Hose-supporter for garments....G. E. Post
Hot-water heater and still, Combined....D. W. Daley
Hub-securing device....J. A. Weitzel
Hydraulic motor....A. E. Weingartner
Hydrocarbon-burning apparatus....H. Hyde
Ice-cream-can attachment....E. G. Appleton
Ice-cutting machine....J. J. Merrill
Ice-cutting machine....G. S. Blackslee
Illuminating device....W. H. Molloy
Insulator-protector....R. R. Sparks
Insulators, Transposition-bracket for....J. E. Skinner
Iron preparation, Production of an organic soluble....W. Jagelki
Ironing-board attachment....C. Burgess
Jar, pot, or vessel for containing or keeping perishable products....A. Perlich
Jars or the like, Closure for....M. C. Schweinert et al
Kinematograph mechanism....R. T. Haines
Lacing....F. W. Whitcher
Lacing-loop for shoes, &c....W. A. Hayden
Ladder for freight-cars....J. A. Ryan
Lamp fixture, Plural-....F. J. Russell
Lamp for helmets and similar head-coverings, Electric....J. H. Dräger
Lamp, Incandescent....H. Gernsback
Lamp, Incandescent electric....W. R. Whitney
Lamp lighting and extinguishing apparatus, Gas-....H. H. Johnson et al
Lantern, Folding....M. L. Williams
Last, Hinged....E. O. Krentler
Last, Link-....E. O. Krentler
Lawn-trimming implement....D. H. Finch
Leather, Cactus....F. C. Wright
Level, Spirit-....W. L. Couture
Level, Spirit-....J. D. Weaver
Light-fixture, Adjustable....G. W. Craighead
Lighting device or torch....F. M. Moore
Liquation-furnace....R. Baggaley et al
Lister and fertilizer-distributer....R. G. Wilson
Load lifting and lowering apparatus....V. Funck
Loading and unloading device...A. A. Egeness
Loading cotton, Machine for....M. P. Jackson et al
Lock....P. F. Augenbraun
Locomotive-cabs, Sliding side panel for....J. N. Holm
Locomotive, Electric....W. Dalton
Locomotive, Rack-rail....G. E. Lynch
Log-fishing grapple....J. T. Teare
Log-turner....A. Foss et al
Logging-tackle....C. Turpin
Loom, Automatic filling-replenishing....A. E. Rhoades
Loom-filling-detecting mechanism....A. E. Rhoades
Loom-filling-carrier magazine....H. Wyman
Loom for weaving short-weft fabrics....J. Garst
Loom, Needle-....J. C. Brooks
Loom threading-machine, Carpet-..H. Heyman
Looms, Selvage-forming mechanism for short-weft....F. E. Arrouquier
Mail-bag-catching apparatus....H. W. Crook
Mail-bag-delivery apparatus....C. W. Hutsler
Mail-bag from railway-trains, Apparatus for delivering....J. C. Groetsch et al
Margin-stop....C. Spiro
Marker, Land-....E. E. Youtz
Match-box....W. Lee
Measure....E. L. Leahy
Measuring apparatus for winding-machines....G. Sipp
Measuring device, Foot-....A. P. Phillips
Mechanical movement....F. H. Richards
Metallic oxids, Obtaining....R. Seiffert
Metallurgical condenser....W. M. Johnson
Metals, Condensing volatile....W. M. Johnson
Mine-transit....W. A. Berger
Molding apparatus....E. Estep
Motor-controller....H. F. Elshoff
Motor-controller....A. L. McHugh
Motor-controller....W. D. Pomeroy
Motor controlling system, Electric-..J. H. Hall
Musical instrument, Double scale-pneumatic....T. Danquard
Musical instruments, Autopneumatic motor for self-playing....J. W. Darley, Jr.
Musical instruments, Sectional modulating attachment for....W. J. Keeley
Musical wind instrument....J. A. Halloway
Negative-pole plate....J. Bijur. (Reissue.)
Negative-pole plates, Treating....J. Bijur. (Reissue.)
Nest, Hen's....A. D. Crosley
Nest, Trap-....E. M. Brown
Nozzle....J. F. MacWilliam
Numbering apparatus, Consecutive....C. Spielmann et al
Oil-switch....E. M. Hewlett
Ore-concentrator....H. L. and E. A. Sulman
Oven....H. Schubert
Package-tie....C. M. Lancaster
Packing and producing same....J. Ostrander
Packing, Piston-....M. J. Quinn
Packing, Rod-....G. K. Howard
Padlock, Keyless....G. W. Kone
Padlock, Seal-....O. Sohni et al
Paint-removing compound....A. J. Hoover
Paper, board, and pulp, Means for manufacturing....W. E. Sheehan
Paper-box ends, Machine for closing and sealing....R. Y. Bradshaw
Paper-making machines and the like, Cylinder-mold for....H. Parker
Para-aminoacetyl meta-toluidin....C. Heidenreich
Party-line indicating ringing key, Four-....C. S. Winston
Peeling and cleaning machine, Potato....S. E. Bailey
Pen, Fountain-....F. C. Brown
Pencil, Automatic....O. L. Harrison
Pencil-cushion....G. F. Ireland
Penholder....E. R. Orchard
Phonograph-record case....W. S. Yell
Phosphates, Making soluble....F. J. Machalske
Photographic use, Flash-light for..E. B. Moore
Photographs translucent, Compound for rendering....A. T. McIlvain et al
Piano fall-board....J. Hattener
Pianos, Repeating action for grand...A. Nickel
Pick....A. Ostlund
Pictorial composition, Device for use in studying....A. B. Johnson
Picture apparatus, Moving....H. S. and L. Isaacs. (Reissue.)
Pile-driver....H. B. Strong
Pipe-wrench....C. E. Adams
Piston....K. Mathews
Planter, Corn-....D. J. Kerger
Plate and dish-cover....F. Staines
Plow....L. Ferry et al
Plow-holder....B. S. Curtis
Potato digger and shaker....M. Hebting
Printing and issuing tickets, Machine for....A. Parker
Printing-machines, Cutting and perforating attachment for....G. F. McAdams
Printing-plate....J. S. Duncan
Printing-press....C. G. Harris
Printing press, Multicolor-....G. E. Pancoast
Propeller, Boat-....R. Adnson
Pulp-wood, Floating crib for transportation of....G. F. Rowe et al
Pump, &c....F. W. Machlet
Pump, Air-....P. P. Bourne
Pumping apparatus, Oil-well...W. C. Beckwith
Quick-acting wrench....C. E. Ragsdale
Rail-bender....D. Belloni
Rail-bond....E. W. Vogel
Rail, Compound....T. S. Cromer
Rail-retainer....T. J. Donovan
Rail-tie....T. B. Modlin
Railway brake-beam, 2 pats....S. A. Crone
Railway-crossing frog....M. J. Walsh
Railway-rail joint....J. M. McConnell
Railway-signal....H. Diehl
Railway signaling apparatus....W. K. Howe
Railway signaling system....C. J. Schwarge
Railway-switch, Electric....M. J. Wightman
Railway-switches, Detector-bar for..A. G. Foley
Railway system, Electric-....H. F. Parshall
Railway-tie....T. F. Gilcrest
Railway-tie, Metallic....A. M. Baird
Railway-tie, Metallic....S. R. Keim
Railway-track curve, Ball-bearing..W. R. Clark
Railway-trains, Signaling system for....S. T. Stewart
Rake....J. L. Kummer
Range utensil, Cooking-....R. B. Dickinson
Refrigerating apparatus....J. Scheideman
Register....O. S. Sturtevant
Resistance, Molded....L. E. Barringer
Revolver-holster....A. H. Hudson
Road-machine attachment....J. T. Eady
Rocker and standard chair, Combination....A. L. Haley
Roost and vermin-trap, Combined poultry-....W. W. Frantz
Rotary engine....J. E. Friend
Rotary engine....H. Lee
Rotary engine, 2 pats....H. W. N. Cole

Rotary pressure-motor....P. T. Coffield
Rotary rake....E. M. Warrenfeltz
Rotary steam-engine....E. F. Edgar
Safe....T. M. Brintnall et al
Salt for domestic and other uses, Preparation of common....G. T. Holloway
Saw mills, Cant-centering device for twin-....A. Mereen et al
Scale....W. G. Templeton
Scale, Weighing-....L. C. Ostendorf
Scraper bracket, Brush and duck..W. B. Will
Screw-driver, Detachable-blade....T. J. Fegley
Scrubber and polisher, Floor..T. Z. Mally et al
Sealing cigars, Means for....H. E. Lipscomb et al
Seines, Attachment for....N. L. Lerille
Sewing and trimming machine....G. Scott
Sewing and trimming machine....J. Hayes, Jr., et al
Sewing-machine....F. Wever
Sewing-machines, Combined presser-foot and guide for....G. J. Stevens
Shade and curtain bracket, Combined....Z J. Standish
Shades and the like, Cord-fastener for....H. S. Hubbell
Shafting, Apparatus for indicating the magnitude of the torque in....J. H. Gibson
Shaft or tunnel boring mechanism....W. F. Wittich
Sharpener, Drill-....D. E. Gilson
Sharpening drills or drill-bits, Apparatus for....W. E. Kimber
Sheets of all kinds, Holder for..H. Müller et al
Sheets uniformly, Device for stretching....C. G. Johannesmeyer
Shoe-cleaning apparatus....B. von Salviati
Shoe-shank-tacking machine....B. B. Waterman. (Reissue.)
Shovel....J. A. Southwell
Shredder-feeder....J. B. Schuman
Sign-displaying device....H. S. Lafond
Sign, Electric....H. J. Walser
Signal system....B. A. Slater et al
Signaling device, Selective....I. F. Manny
Siphon....J. Martin
Siphon, Dispensing-....J. A. Schultz, Jr.
Skip, Dumping-....W. D. Lockwood
Skirt-marker....A. Waterman
Slag-granulating apparatus....I. C. Hoffman
Sleigh....C. A. Wetmore
Sleigh, Self-propelled....C. E. Tetreault
Spark-plug attachment....F. D. Casey
Speed-changing device....J. Riddell
Speed-indicator....J. L. Hall
Spinning-mule....J. J. McGlincy
Spool-holder, Factory....A. S. Nichols
Springwork....J. A. Staples
Stair-rod....W. G. Altland
Stalk-breaker....D. P. Shaw
Stamp-affixer....G. B. Smith et al
Stamping and numbering machine....E. W. Crossan
Steam equalizer and separator....D. M. Stott
Steam-trap....T. R. Whittaker
Steam-trap for radiators....F. L. Watson
Steam-trap, Return....H. V. Pearce
Steaming apparatus....H. E. Belz
Steel from chromiferous pig-iron, Manufacturing....F. D. Carney
Steel, Manufacture of....S. Stapleford et al
Stiffening-strip....A. A. Ackerman
Stirrup, Safety-....S. A. Hall
Storage apparatus....T. C. Kennedy
Stove, Heating-....C. F. Minnick
Stoves or to the gas-rings used for heating pots, irons, &c., Hot-water-service attachment to the burners of gas beater....J. J. Strain
Stuffing-box....W. J. Weinman
Superheater....H. B. Oatley
Swing....J. Follmer et al
Switch-frog....H. F. Roach
Switch-keys, Bank of locking....E. R. Corwin et al
Switch mechanism....J. B. Wiard
Switch-point thrower....R. Pasquale
Table and bed, Combined....E. P. Smith
Table lock, Extension-....C. S. Burton
Table-pad, Sectional....O. Winter
Table slide, Extension-....O. G. Franks
Talking-machine sound-box....L. F. Douglass
Teeth for filling, Treating....F. Armstrong
Telegraphic-code condenser....M. B. Dickie
Telephone and other circuits, Microphone apparatus for....O. Majorana
Telephone system....P. V. Smith
Telephone-relay....E. F. W. Alexanderson
Telephone-repeater....L. A. Lindsey
Telephone-transmitter....G. F. Atwood
Tent and sleeping-bag, Combination....F. W. Burch
Testing-machine....F. K. Landgraf et al
Threshers, Swinging conveyer for band-cutters and feeders of....F. S. Peabody
Tie-fastener....J. P. Chambers
Tie-plate....F. A. Piper
Tire....E. T. Greenfield
Tire-protective rivet....E. B. Stimpson
Tire-protector....F. G. Crone
Tire, Sectional....H. O. Craven
Tire, Vehicle-....F. A. Stall, Jr.
Tongue supporting and locking means....M. Meyer et al
Tool, Fluid-pressure-engine-operated....G. H. Gilman
Tool-support, Adjustable....F. H. Richards
Tooth-cleaner....E. E. Sulzer
Toy....W. S. Miners
Trace-holder....B. C. McKay
Tracker-bar and music-sheet mechanism....W. J. Keeley
Tracker-bar mechanism....T. Danquard
Tracker-bar-operating mechanism..T. Danquard
Tracker mechanism....T. Danquard
Tracker mechanism, Double....T. Danquard
Traction-wheel....F. Bottrill
Traction-wheel....W. L. Martin
Transplanter....T. Gooch
Trolley-guard....W. D. Lewis
Trolley-wires or other conductors carrying currents of high voltage, Suspension device for....G. A. Mead
Truck, Car-....A. F. Batchelder
Truck, Car-....J. G. Sarvent
Truck, Electric-car....F. F. Stowe
Tube-cleaner....T. Andrews
Turbine....C. Roth
Turbine-bucket....E. H. Farquhar
Turbine-buckets, Apparatus for manufacturing....E. H. Farquhar
Turbine-buckets, Manufacturing....E. H. Farquhar
Turbine-governor....W. L. R. Emmet et al
Type-casting mold....I. Baas
Type-mold....I. Baas
Type-writer....J. W. Paul
Type-writer tabulating device....C. S. Labofish
Type-writing machine....G. J. Barrett
Type-writing machine....H. W. Merritt
Type-writing machine....H. H. Steele
Type-writing machine....O. Woodward
Type-writing machine, 2 pats....J. W. Paul
Type-writing machine....E. E. Barney
Type-writing machine....W. C. Farnum
Typographer's composing and founding machine....H. Burris
Unloading apparatus..F. H. and F. H. Brown
Valve....J. F. Love
Valve....J. P. L. Halyburton
Valve, Automatic starting-....J. B. Lane
Valve, Filter-....C. Hungerford
Vapors, Means for withdrawing and condensing....C. B. Lowry et al
Vegetable peeler or scraper....E. W. Milhado
Vehicle draft apparatus, Equalizer-hook for....J. B. Ashenfelter
Vehicle-driving mechanism, Motor-driven-....H. T. Hansen
Vehicle-springs, Emergency repair device for....D. P. Power
Vehicle-wheel....A. A. Daugherty
Vehicle wind-shield....W. N. Beecher
Vending carton or package....B. C. Tillinghast
Ventilating buildings, Automatic means for....D. F. Speer
Wagon-brake....J. Wulf
Washing-machine....J. Becker
Washing-machine gearing....B. L. Schmidt
Watch-regulator....J. J. Wiens
Watches, clocks, and the like, Producing movement-plates for....W. E. Porter
Watchcase-pendant, Dust-proof...M. Rosenhaft
Water-closet....F. O. Hilfiker
Water-gate, Automatic constant-discharge....F. W. Hanna
Water-motor....A. W. Breiding
Water-purifying and like apparatus....A. L. Helwig
Wave-responsive device....C. D. Babcock
Weather-strip....S. Frigone
Weighing-machine, Automatic....D. A. Flavell
Wells, Spear for oil-....W. C. Beckwith
Wheel....R. K. Gregory
Whip-lock....W. J. Arnett
Whip-socket, Lock-equipped....M. Ellingson
Window....O. M. Edwards
Window-screen, Adjustable....E. A. Reitz
Wire-connector....H. W. Wyckoff
Wire machine, Barb-....W. A. Kilmer
Wire-netting machine....A. E. Barlow
Wire pile fabrics from printed warps, Manufacturing....P. and C. Kappler
Wire-splice....W. E. Huber
Wire-stretcher....P. L. Brooks
Wires, Apparatus for connecting conducting and other....A. Fodor
Wires, cords, threads, and the like, Treatment of....W. A. Phillips et al
Wood-fiber machine....H. M. Hoover
Work-performing members, Mechanism for operating adjustable, 2 pats....F. H. Richards
Working members, Mounting for adjustable....F. H. Richards
Wrench, 2 pats....S. A. Holman
Wrench....I. L. Frye
Wrench....S. V. Rehart
Wrench....H. F. Larava
Yoke holder, Neck-....J. Pauly
Yoke, Neck-....W. Kleineschay
Yoke, Neck-....O. H. Nason

DESIGNS.

Bib, Washtray-....W. H. Dehn
Cabinet, Information and directory....E. A. Ovenshire
Candle-holder....W. A. Jameson
Clock-stand and picture-frame....G. Keppler
Copy-holder....W. J. Willson et al
Emblem....B. E. Burke
Emblem or similar article....J. Hoffmann
Glass vessel....A. Steffin
Key....C. E. Johnson
Mirror or picture frame....J. P. Eustis
Paving-brick, Skeleton....A. A. Mullen
Spoon, fork, or similar article....H. Hillbom
Spoons or similar articles, Handle for....J. Mayer
Stone, Cut....E. G. H. Schenck
Stove....D. T. Turney
Stove, Cooking-....J. S. Van Buren
Stove, Heating-....G. Alig
Toy bank....J. H. Bigalow

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MECHANICAL PATENTS.

Accounting system, 3 pats....E. C. Albree
Advertising device....L. S. Sharps
Advertising device, Automatically-changing....M. Tannert et al
Air-brake....W. P. Gentleman
Air moistener and evaporator....O. R. Rice
Air, Purifying and bumidifying....W. G. R. Braemer
Alarm-switch, Friction-held....F. R. Alford
Alfalfa-disk....L. E. Waterman
Animal-trap....W. I. Wolverton
Animal-trap....L. Horinko
Auto-door stop....U. H. Hill
Automobiles, Air-purifying device for....H. E. Whiting
Automobiles, Combined lamp and license holder for....J. M. Sharp
Axle-box....J. R. Fleming
Axle-journal....W. Betz
Axle, Road-vehicle wheel-....L. Granieri
Axle-setter....J. S. Cross
Axle, Vehicle-....W. Betz
Bake-pan....M. Olshaskie
Bale-tie....S. Cary
Bale-tie....T. S. Drake
Bale-tie....D. Margolius
Bank, Coin-....P. J. Maley et al
Barrel, Metallic sectional....J. B. Smith
Bath-tubs, basins, and like fixtures, Waste for....P. F. Guthrie et al
Bearing, Roller-....W. H. Sheasby
Bearing, Roller-....J. F. Foster
Bearing, Self-adjusting....J. V. M. Risberg
Beds, Folding crib attachment for....J. T. and B. F. Rademaker
Bedstead....F. E. Hall
Bell, Sound-reproducing....C. G. Conn
Bicycle....L. M. Silva
Binder, Loose-leaf....H. C. Miller
Binding-post....C. Cuno
Blotting-pad....W. F. Mahony
Blower-casing....W. W. Wainwright
Boat-handling device....L. Tanning et al
Boiler....H. O. Keferstein
Bolts, tenons, &c., Tool for drawing....S. O. Duemler
Book, Writing-....J. W. C. Gilman
Bookbinding....F. Bollenbach
Bookcase, Sectional....A. D. Oles
Bottle-closures, Making....H. S. Sheppard
Box....A. J. Vance
Box-machine....W. H. Parker
Brake attachment for hay-wagons, &c....R. E. Berry
Brick-machine....J. F. Ublhorn
Bricks, shaped stones, or blocks, tubes, tiles, and the like, Manufacture of....H. Dresler
Brine-producer....F. Tyson
Broiling meats and the like, Apparatus for....G. Giovanna
Brooder....A. R. Lewis
Brush and powder-holder, Combination tooth-....F. W. Archer et al
Buffer mechanism....W. W. Perkins
Buggy-top, Folding....R. Kolbe
Building construction....G. M. Newhall
Bullet-probe....G. E. Marshall
Button, Cuff-....P. Truccot
Cabinet, Portable developing-....R. H. Brown
Cabinet, Wall-, 2 pats....T. Kundtz
Cable-trace....S. Shisler
Camera, Folding photographic....P. Kaemmerer
Can-opener....C. E. Sands
Canceling letters, Machine for....S. J. Evans
Candle holder and hanger....V. Engman
Candle-shade support....W. R. Noe, Jr.
Candy, Making....L. Hirschfeld
Capsule intended to contain compressed gases..P. Giron
Car construction, Railway-passenger-....E. R. Carrington
Car corner structure....S. M. Curwen
Car coupling, Railway-....J. W. F. Sole et al
Car-door mechanism....C. A. Lindström
Car draft-rigging, Railway-....J. F. O'Connor
Car, Dumping-....M. H. Treadwell et al
Car for mines, Sprinkling-....P. Doney et al
Car, Freight-....S. Otis
Car-hauling device, Mine-....J. Rowney
Car-replacer....C. M. Sullivan
Car-step, Folding....S. L. Marcus
Cars, Controller for motor traction-....W. C. Mayo
Cardboard blanks, Machine for making....J. E. Fellows et al
Carriage, Motor-....J. C. Sherman
Carriage-top rest....W. R. Roote
Cartridge-loading machine, Dynamite-....A. Person
Cementitious material, 2 pats....H. S. Spackman et al
Cementitious material and preparation thereof..H. S. Spackman et al
Centering device....L. J. Jones
Chimney....J. D. Barber
Chisel....B. W. Howe
Churn....A. Barber
Cigarette-former....J. E. Wood
Cigarette-machine....C. A. Marchal
Cisterns, Form for making....T. B. Lepley
Closet connection....G. M. McCloskey
Cloth-stentering-machine clip....A. A. Whitley
Clutch....F. M. Prather
Clutch....C. W. Pradeau
Clutch and brake mechanism, Ratchet....J. M. Daly
Clutch for die-presses, Non-repeating....J. L. Allen
Coal and ore handling machinery, &c....W. Seaton, Jr.
Cock, Ball-....H. N. Libbey
Colander....H. L. McCoy
Collar-stay....H. C. Gustafson
Collar-stretching machine....W. J. Beattie
Column....E. H. Wentworth
Commode, Invalid's cabinet-....J. Jones
Commutator-motor, Single-phase..G. W. Euker
Concrete-mold, Portable....D. W. Smith
Concrete piles, Forming....R. J. Beall, Jr.
Concrete structure....C. B. Grady
Condenser, Steam-....C. Amhrose et al
Controller....W. D. Pomeroy et al
Cooker, Cotton-seed-meal....J. L. Cunningham, Jr.
Cooking apparatus, Odorless....W. S. Bowie
Cooling-conveyer....W. Altman
Cooling-tower....B. F. Hart, Jr.
Core-box used in tbe art of molding for metal-casting....L. F. Millard
Core compound....S. Haley
Core-drilling apparatus, Shot-feeding means for....F. H. Davis
Cork, Purifying....J. Serra (y Carbó)
Corn from the cob, Device for removing green....R. M. Clift
Corn-husking machine....W. Hibbs
Corner-bead....F. White
Cotton-chopper....C. L. Ferriott
Cotton chopper and cultivator....R. H. Purnell
Cotton-compress....T. B. Lee
Cotton elevator and distributer....T. J. Simmons
Couch, Combination-....J. Stander
Couch-roll....J. Symons
Crane, Water-....N. E. and A. W. Otto
Crate, box, or binder, Shipping....E. Norton
Crate or box for sheet-metal plates, 3 pats....E. Norton
Cravat-former....S. H. Smith
Crayon-trough....S. W. Knisely
Cream-separators, Adjustable cream-exit for centrifugal....C. H. Hackett et al
Cuff, Reversible....A. D. Ray
Culinary utensil....H. F. Hall
Cultivator....J. N. Starlin
Cultivators, Hand-lever for riding-....W. E. Johns
Curtain and shade holder....A. Koretz
Curtain-pole hanger....C. Wowra
Cycle mud-guard, Motor-....W. Maughan
Dam....J. F. Jackson
Dash-pot mechanism....H. F. Myers
Dental cement....J. N. Crouse
Dental-tool moistener....S. Craig
Detector....C. D. Ehret
Detector-bar....C. Herringer
Detergent for use with hard and salt waters....R. Macpherson et al
Die-stock....H. W. Oster
Digging implement....J. P. Manahan
Disinfecting apparatus....J. N. Mitchell
Disinfecting device....J. E. Lee
Display-package....G. H. A. Roehrig
Display-receptacle....M. Gianini
Ditching and grading machine..M. G. Bunnell
Door....J. Maier
Door-closing device....R. S. Cummings
Door-securer....J. P. Stoffel
Drill....A. E. Jennings
Drinking-fountain....R. Partington
Drying-machine....J. Black et al
Dye and making same, Orange-to-yellow vat....B. Mayer et al
Ear-drum, Invisible....F. M. Way
Easel....G. Booth
Egg-carrier....W. R. Stokely
Electric-generation system....F. R. Babcock
Electric generator, Pyro-....G. J. Vokel
Electric-light fixture....J. H. Goehst
Electric switches, Push-button for....G. W. Goodridge
Electrical-distribution system....J. H. Tracy
Electrolyte for electroplating....O. Meyer
Electromagnet....B. W. Sweet
Electroplating method and apparatus....G. A. Lutz
Elevated carrier....B. Snyder
Embroidering-machine, 2 pats....J. A. Groebli
Embroidering-machine bore mecbanism....J. A. Groebli
Embroidering-machine coupling mecbanism....J. A. Groebli
Embroidering-machine festoon mechanism....J. A. Groebli
Embroidering-machine stop mechanism....J. A. Groebli
Emery-wheel dresser....H. A. S. Howarth
Engine controlling mechanism....G. Enrico
Engine indicator....G. Lanza
Engines, Dynamometer for explosion-....N. M. Hopkins
Engines, Ignition system for explosion-, 2 pats....R. Varley
Esters, Producing borneol....E. Bergs
Explosives, Producing plastic....E. Steele
Expression-box....J. Hattemer
Fan....G. Wigand et al
Fare-register operating mechanism....J. H. Shockley
Farm-gate....G. W. Gwyn et al
Fastening device....A. C. Goddard
Faucet....C. B. Whitney
Feed-gage bracket....L. W. Reinbardt
Feed-mixer....P. McEvoy
Feed-water-heater cleaning device..T. V. Elliott
Feeding device....J. Mathison
Fence-post....F. T. Cherry
Fence stay, Wire-....R. L. Horsley
Fence stretcher, Wire-....E. R. Carr
Filter....W. B. Klein
Filter....L. H. Deppe
Filter-plate....W. B. Klein
Filter, Water-....F. C. Farnell
Fire alarm and extinguishing system, Combined....C. E. Buell
Fire-alarm system, Automatic....C. J. Fox
Floor-clamp....W. B. McCullough
Fluid compression, Apparatus for centrifugal....S. A. Reeve
Fluid-meter....J. W. Ledoux
Fluid-pressure-operated drill....A. F. Ross
Fluid-pressure system....B. Aikman
Flying-machine....J. and P. Cornu
Folding box....C. W. Elson
Folding chair....G. Callahan
Friction member....W. T. Bonner
Fumigating-tent and using the same....A. W. Morrill
Fumigator....D. F. Foltz
Furnace....G. W. Cope
Furnace....A. H. Kidney
Furnace-door....S. P. Howe
Furnace-fumes, Means for exhausting and condensing....A. H. Kidney
Furniture and bed spring, Edge-supporting....J. L. Radermacher
Furniture, Post-office....R. T. Bourn
Garment-hanger....M. O. Penland
Garment-support....H. C. Wilson
Gas-burner, Inverted....A. L. Voorhees
Gas-burner safety attachment....H. J. Schoen
Gas-generator....I. McDaniel et al
Gas-producer....P. Schmidt et al
Gas-scrubber....A. L. Galusha
Gear, Friction-hoist....E. W. Cokely
Gins and cotton-seed linters, Saw-cylinder for cotton-....H. W. Ligon
Glass articles, Device for manipulating cut-, 2 pats....F. G. Farnham
Glass, Manufacture of wire-....C. Apple et al
Glass tops for salt-shakers, &c., Manufacture of....P. Ebeling
Graders, Deflector for elevating....W. H. Morenus
Grain-washing machine...W. F. Mullaney et al
Gramophone....A. Henry
Graphophone, Disk....T. H. Macdonald
Grate....P. Schoen
Grease-plugs, Locking device for....D. S. Guenther
Grinding points, Machine for....J. Ohanian
Grinding teeth of gear-wheels, Machine for....F. A. Phelps
Gun, Air-....E. C. Hough
Gun-lock....A. J. Aubrey
Gun, Vaporic steam-....G. W. Browne
Hair-roll....T. P. Taylor

Hame attachment....G. Siegenthaler
Hammers, Nail-holding attachment for....J. S. Johnson
Harness....A. Hauck
Harrow riding attachment....S. B. Hazard
Hat-guard....C. E. Westlund
Hat-protector, Waterproof....E. A. Kendall
Hay-presses, Packer for....C. S. Starr
Heading-machine....W. M. Taylor
Heat-controlling apparatus....M. J. Brierty
Heating system....E. H. Gold
Hides, Treating....W. J. Ward
Hinge....M. L. Robbins
Hinge....H. K. and H. L. Fairall
Hinge, Spring-....D. W. McNeil
Hinge, Transmitter-....J. A. Birsfield
Hog hanger and spreader....J. Heim
Hog-trap....W. S. Phillips
Hog-trap, operating-table, and loading-chute, Combined....G. T. Allison
Hogs and cattle through the backbone, Machine for splitting....A. M. Burleson
Hoof-pad....D. T. Barber
Hook and eye....H. N. Legan
Horse eye-screen....C. S. Rogers
Horse-legging....J. F. Bowlds
Horseshoe....L. N. Beauchemin
Horseshoe....P. W. Carney
Hose-coupling....W. T. De Worth
Hose-nozzle carriage and hoisting device....E. J. Petru et al
Hose reel, Garden-....E. Bergland
Hot-water tube....L. H. Meres
Humidifier, 2 pats....C. Subert
Ice-cream freezer....F. Tyson
Ice-shaver....W. S. Brown
Illuminating system, Intermittent...F. B. Badt
Indicator....G. Brown
Ingot-mold....H. M. Gray
Inhaler....E. F. Philbrook
Ink-well....J. Schulz
Internally-fired boiler....T. C. Mason
Invalid's table....L. P. Wentzell
Ironing-machine....W. H. Olver
Ironing-machine....F. Krapp
Jug....S. E. Tombleson
Keg or vessel....A. J. Moxham
Key-guard....A. and S. de Paemelaere
Key-handle....F. R. Alford
Key-operated machines, Attachment for....J. Vidal y Diaz
Knob and thumb-latch lock, Transformable....W. A. Russell
Labeling-machine....J. R. Harbeck
Lacing-hook-setting machine....W. F. Frazer
Lamp, Arc-....R. P. Myers
Lamp socket, Incandescent-electric-....G. B. McBean
Lamp wick-raiser, Miner's-....L. P. Eisenbeis
Lantern, Storm-....G. Stübgen
Lap-robe....W. G. Rasch
Lathing, Expanded-metal....H. Peters
Lawn-edge cutter....F. Heather
Lawn-sprinkler....J. J. Darrow
Level....F. Schtabe
Level, Plumb-....J. A. and F. L. Traut
Lifting-gear, Hydraulic....P. Gauer
Lifting-jack....M. L. Jenkins
Liquid-separator liner, Centrifugal....J. V. M. Risberg
Litter-carrier....B. Dahl
Loading apparatus....W. E. Grover
Lock-washer....J. B. Ross
Logging-jack....C. D. Moore
Loom shuttle-check....E. H. Smith
Loom take-up....F. T. Withee et al
Loom-temple....E. H. Spedding
Loom warp let-off....F. T. Withee et al
Loom warp stop-motion....F. E. Kip
Loop and button-clasp....F. A. and J. B. Russ
Lubricator....J. C. Hill
Magnet for telegraphones....H. R. Stuart
Mail-bag catcher....B. F. Wright
Mail-bag catcher and deliverer...E. Waterbury
Mail-box....S. T. Whitaker
Mail-box....J. Kouba
Mail-delivery apparatus, Automatic....J. Saulesberry
Mail-handling apparatus....M. M. Miller et al
Manure-spreader....D. K. Wilson
Mask, Respiration-....G. F. Goodnow
Match-safe....A. Peterson
Measuring device....J. F. Teykl et al
Measuring device, Tailor's....S. Anderson
Merry-go-round, Aquatic....H. E. Riehl
Metallic pipe....G. H. Charls
Milk and other liquids, Vessel for storing and transporting....N. C. Nielsen
Milk-treating apparatus....H. D. Cooke et al
Mine-cages and the like, Safety brake mechanism for....H. A. Walker
Mine-cages and the like, Safety mechanism for....K. W. O. Schweder
Mine skips, cages, &c., Safety device for....J. Spry
Mining-machine, Pick....E. C. Morgan
Moistener, Stamp-....C. H. Mauk
Mold....L. J. Garnet
Mold....J. Wilson
Molding-box....W. Collins
Motor-control system....E. W. Stull
Music-leaf turner....J. Havlina
Musical instruments, Playing attachment for....G. B. Kelly et al
Nail-driver, Pneumatic....S. B. Stewart
Nails, Instrument for separating the cuticle from the....R. Amory
Napkin-supporter....C. Durfresne
Necktie....M. F. Powers. (Reissue.)
Nitric oxid, Producing....I. L. Roberts
Nut-lock....A. B. Conn
Oil burner, Crude-....J. H. Thieler
Oil burner, Crude-....G. Toliver
Oil-cake-stripping machine....A. W. French
Oil-cloth rack....C. C. Sisler
Olive and pickle fork....F. I. Johnson
Operating-tables, Stretching attachment for....G. R. De Nise
Oyster-opener....C. C. Chancey
Package-closure....W. W. Anderson
Package-tie....S. B. Staley
Packing material....M. E. Ryan
Paper-feed mechanism....G. B. Maegly
Paper-interleaving machine....H. Sauter
Paper receptacle....G. W. Maxwell
Paper receptacle....C. T. Bloomer
Paper-sheet-feeding machines, Corner-buckler for....A. A. and I. F. Mandell
Pasteurization....A. Goetz et al
Pasteurizing apparatus....C. H. Loew
Pasteurizing apparatus....F. Tyson
Paving apparatus, Street....H. J. Rufli
Phonograph-stopping attachment....A. Kandall
Physical-culture apparatus....G. R. De Nise
Pick....E. Terry
Picture-displaying cabinet....A. Pinkerton
Pincers, Stretching-....W. P. Ellis
Pipe-bending machine....C. F. Kirby, Jr.
Pipe-cleaner....J. H. Clearwater
Plane....A. Link
Planter attachment, Corn-....C. J. Foster et al
Planting attachment....L. E. Waterman
Plastic composition....H. S. Spackman et al
Plates, Manufacturing....H. E. Sheldon
Plow, Steam-....F. Violati-Tescari
Plow, Wheeled....S. V. Weeks
Plows, Spring-trip for....L. E. Waterman
Plowshare....F. M. Awalt
Plowshare-fastener....E. F. Spinner
Pocket for shirts....S. Elbaum
Pole-socket....F. Moench
Post-binder....L. Senge
Postmarking-machines, Stacking mechanism for....P. J. Madigan
Postal card....J. A. Drinkwater
Poultry-fount....W. F. and D. H. Ycrain
Pouring filling material in crevices, Device for....W. C. Jones
Power-transmitting apparatus....S. F. Orr
Press....H. Richard
Pressing-roller....C. Wiebke
Pressure-regulator....F. A. Simonds
Printing on wood....E. Josz
Printing-surfaces, Apparatus for producing....W. C. Huebner
Propeller for air-ships....P. S. Davis
Propulsion system, Ship-....C. A. Parsons
Protractor or divider....D. M. Campana
Pulleys, Self-lubricating bushing for....C. A. Petersen
Pump....C. J. Hartley
Pump, Rotary....T. R. Hayton
Punch....G. J. Blum
Pyrotechnic device....C. F. Graber
Radiator-humidifier....G. J. Palmer
Radiators, Elbow connection for....J. J. Stockdon
Rail-joint....M. F. Trenchard
Rail-joint....J. Wolfe et al
Rails, Anticreeping device for....R. F. Downey
Railway-frog....C. C. Lucas
Railway-signaling apparatus....E. R. Brodton
Railway-spike....E. J. Bricker
Railway-switch....J. M. Faller
Rail-switch....C. C. Swan
Razor and stropper, Combined safety-....W. S. Tabb
Receiving apparatus....H. Shoemaker
Ring-clamp, Jeweler's....M. Greer
Roaster and cooker....A. Day
Robe-holder....J. Appleton
Rolling machine, Metal-....A. Ridd
Rope-grip, Safety....C. F. Cinclair
Rotary cutter....G. P. Youmans
Rotary engine....F. C. Krüger
Rotary engine....L. A. Hord
Rotary engine....W. Risley
Rotary engine....F. A. Jayne
Rotary engine....J. Westerlund et al
Rotor construction....C. E. Lord
Rubber-securing device....H. J. Lozier
Rubbers, Name-plate and fastener for....S. N. Fleck
Saw-carriage set-works....J. M. McLaren
Saw, Circle-....H. C. Heno et al
Saw-swage....F. Brunett
Scaffold....J. M. Dibler
Scale....B. D. Emanuel
Scale....C. H. Hapgood
Scale, Spring-....C. Sirch
Scale, Weighing-....H. M. B. Bary
Scissors and shears....E. Helderman
Screw-driver....J. L. Rollins
Screw-drivers, Locking mechanism for ratchet..Z. T. Furbish
Screw, Expressing or packing....H. Auchu
Selling apparatus, Automatic....F. Rafoth
Sewer-cleaning apparatus....W. H. Stewart
Sewing buttons to the uppers of boots or shoes, Machine for....J. Mathison
Sewing-machine attachment....L. M. Tynes
Sewing machine, Chain-stitch shoe-..J. J. Heys
Shaving-cup....J. Holzsager
Sheets, Apparatus for holding flexible....N. W. Carkbuff
Ships at sea, Apparatus for coaling....A. John
Shoe....W. S. Telford
Shoe-creasing device....W. E. Baldwin
Shoe-shank....A. Munsey
Shoe-tree....J. S. Hansen
Shoulder-brace....M. W. Ferris
Sifter, Stove ash-....G. Nostwick
Sifting-shovel....E. G. Felty
Signaling apparatus, Electric....N. M. Watson
Skee....L. H. Hannas
Slurry and like mill....E. J. Clarke
Smoke-preventing compound....F. E. Jacobs
Smut-machine....R. M. Holland
Sodium hydrosulfid, Producing..W. Hasenbach
Sodium thiosulfate, Making....W. Hasenbach
Soldering apparatus....D. Genese
Speed-controlling and reversing apparatus....H. T. Coldwell
Speed-indicator....L. Work
Spinning-frame attachment....A. Duckworth
Spinning-machine....J. Jackson
Spinning-machine spindle....A. Long
Spring construction....C. Burgess, Jr.
Stacker, Hay-....J. A. Schertz
Stacker, Pneumatic....J. K. Sharpe, Jr.
Stackers, Fan for pneumatic..J. K. Sharpe, Jr.
Stamp, Dating-....B. B. Hill
Stay-strip....C. H. Crowell et al
Stereotyping-machine....A. L. Case
Stirrup....H. Krieg
Stoker....T. V. Elliott
Storage battery....D. P. Perry
Storage battery....S. Lake
Stove attachment, Cooking-..R. A. Shaffer et al
Stovepipe-fastener....A. T. Peterson
Strainer, Milk-....A. L. Mowry et al
Strap-fastening....D. MacMillan
Surgical purposes, Mouth-gag for....A. M. McIntosh
Surveyor's instrument....H. C. Schultz
Suspensory device....F. Day
Swingletree and doubletree....G. P. Simpson
Syringe, Vaginal....C. F. W. Ramus
Syringe, Vaginal....O. Katzenberger
Table....A. J. and C. M. Fike
Telegraph apparatus, Type-printing-....G. A. M. Agrell
Telephone and fire-alarm system, Combined....C. E. Buell
Telephone-exchange system....E. R. Corwin
Telephone mouthpiece attachment....J. W. McBrine
Telephone substation set....J. A. Birsfield
Telephone system....H. G. Webster
Thermic mixture....H. Goldschmidt
Thermostat, Differential....W. H. Carrier
Thill-coupling, Quick-shifting antirattling....C. E. Sjoman
Threshing-machine....J. O. Carlson
Threshing machines, Adjustable concave for grain-....J. O. Carlson
Time-indicator....J. C. Loughry
Tin, Extracting....E. C. Higgins
Tire....F. A. Ellis
Tire-jackct for venicle-wheels....J. Bowie
Tire, Vehicle-....G. Lambright
Tire, Vehicle-....J. A. Swinehart
Tires, Connection for inflating....W. Boyd
Tires, Indicating device for use with pneumatic....T. and R. Sloper
Tires, Machine for treating metallic....E. L. T. Schaub
Tobacco-lath holder....E. M. Waldref
Tobacco-pipes and the like, Apparatus for cleaning....A. Marr
Tool, Combination-....A. Fenn
Tool-holder....G. E. Greenleaf et al
Tool-holder....L. Boley
Tool, Watchmaker's....R. Caplan
Toy, Child's....A. Stange
Trace-splice....S. W. Reynolds
Track-fastener....G. W. Nevins
Track-switch....J. J. Ruddick
Tracker....T. P. Brown
Transmission mechanism....H. Cave
Trolley-wheel....L. J. Tetlow
Trolley-wheel and harp, Ball-bearing....S. Tully, Jr.
Trousers....F. Sabbatani
Trousers-creaser....C. D. Fahl
Truck, Hand-....A. Anderson
Tube or pipe cleaner....E. Hoglund
Tug, Harness shaft-....C. P. Hatfield
Tuning-pin....J. Hcginbothom
Tunneling under streets, roads, squares, tracks, and the like....J. Knudsen
Turbine....C. Sawin
Turbine-blade fastening....C. Roth
Turbine, Steam-....J. Atkinson
Turbine, Steam-....G. Belluzzo
Twine-machine....I. Good
Tying device....E. E. Braisted
Type-holder....J. S. Duncan
Type-washing machine, 2 pats....W. Danenhower
Type-writer attachment....C. L. Downey
Type-writing machine....L. Faverio
Type-writing machine....J. Felbel
Type-writing-machine ribbon-spool....G. B. Brand
Universal joint....M. E., C. C., H. E., and C. W. H. Blood
Upholstering-machine....I. Karpen
Valve....L. W. Eggleston
Valve-controlling apparatus....W. B. D. Penniman
Valve, Flushing....F. T. Callon
Valve for gage-cocks....M. P. Snell
Valve-gear....C. J. Pilliod et al
Valve-operating mechanism....A. E. Greene
Valve, Tank-....C. A. Lindström
Vanner-roller....H. L. Jennings
Vehicle....C. E. Howe et al
Vehicle-brake....G. Enrico
Vehicle controlling device, Motor-..F. S. Davis
Vehicle sanding apparatus....J. Taylor
Vehicle speed-controlling and reversing apparatus, Motor-, 2 pats....H. T. Coldwell
Vehicles, Steering of coupled....R. Jonas
Veterinary vaginal speculum....I. Pasley
Vise....F. W. Hubbard
Wall-tie....S. Priest, Jr.
Warp stop-motions, Lint-remover for electrical....E. Champagne, Jr.
Washing-machine....A. A. Day
Water, Apparatus for the treatment of refractory....J. Schneible
Water-distributer....W. C. Johnson
Water-gage....C. J. Matthews
Water-heater....E. Ruud
Water, Purifying....W. M. Jewell
Water-purifying apparatus....A. Sorge, Jr.
Water-tube boiler....W. Dougherty et al
Wave motions, Apparatus for demonstrating and illustrating....C. Forbes
Weighing-machine....H. M. B. Bary
Wells, Valve attachment for oil-...J. M. Reece
Wheels, Making metal....C. T. Schoen
Winder....C. Wiebke
Winding mechanism....C. Wiebke
Windlass, Sweep-operated....A. C. Van Slyke
Window-cleaner....G. L. Holland
Window construction....E. H. Lunken et al
Window, Reversible....G. J. Miller
Window construction, Fireproof....E. H. Lunken et al
Window construction, Fireproof....C. M. Conklin et al
Window, Self-closing....E. H. Lunken et al
Window-stop....R. W. Hubbard
Wire-clamps, Tool for making and applying...E. M. Coghlan
Wire-stretcher....J. Dobhs et al
Wire-stretcher....S. S. Roberts
Wire-stretcher....J. Johnson
Wire tightener and splicer....J. D. Rodgers
Wood-fiber-making machines, Grinding element for....H. M. Horn
Wrench....G. Paterson
Wrench....R. S. Barrett
Wrench....A. W. Petersen
Wrench....W. C. Reed
Wringing-machines, mangles, and the like, Roller for....G. L. A. Kapp

DESIGNS

Brushes, mirrors, or similar articles, Back of....W. A. Jameson
Bridle-bit....F. C. Monier
Cigar-band....C. P. Young
Comb....B. W. Doyle
Light-shade....L. R. Hopton
Mirror or similar article, Hand-...S. A. Keller
Plate....H. E. Dudley
Register face-plate....H. J. Valentine
Toy bank....L. Krajeski

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MECHANICAL PATENTS.

Abdomen-compress and hose-supporter, Combined, 7 pats....T. P. Taylor
Adding-machine full-stroke mechanism....R. E. Benner
Air and gas engine....H. T. Dunn
Air-brake....W. R. Heironimus
Air-brake slack-adjuster....W. R. Heironimus
Air, Drying....L. Block
Amusement apparatus....E. Marrder
Amusement apparatus....G. C. Tilyou
Amusement device....W. B. Leonard
Animal-trap....T. Bushey
Automobile....C. J. Paulson
Automobile danger-signal....O. Herrmann
Axle, Vehicle-....H. B. Bush
Badge....F. R. Bignold
Bag fastening device, Hand-..C. F. Kohlberger
Bait, Artificial....G. H. Slocum et al
Basket, Washboiler-....W. W. Wilkinson
Bath apparatus, Vapor-....K. Hickox
Batteries, Forming plates for storage....W. Morrison
Bearing, Ball-....J. F. Springer
Bed, Folding....L. Jensen
Belting clamp, Rope-....J. Kast
Bicycle crank-hanger....G. H. Meiser
Bicycle handle-bar....H. D. Griswold
Bicycles, Carrying attachment for....J. Jahnel et al
Bill-hook....F. Lindemann
Binder....J. F. Tapley
Binder for sand cores, briquets, &c....E. D. Frohman
Block-signal system, Electric....P. J. Simmen
Boiler....J. J. Rohan
Boiler draft-regulator, Steam-....W. A. Kitts
Boiler tubes, Tool for spreading water-tube-....J. F. Dugett
Bolt....F. McInnerny
Book, Laundry record-....E. W. Gray
Book-support and adjustable shelf-partition....W. M. Poindexter
Bottle attachment....J. J. Healy et al
Bottle-closure....A. Dreyer
Bottle-covering machine....W. P. Catlin
Bottle-lifter....W. P. Catlin
Bottle, Non-refillable....H. Nater
Bottle, Non-refillable....J. H. Richard
Bottle-stopper, Non-refillable...J. F. Fitzgerald
Bottles or glass receptacles, Covering....W. P. Catlin
Box and shipping package....F. W. Barnes
Box cover, Outlet-....G. B. McBean
Box-fastener....R. C. Bender
Box for soap, polish, pomade, &c..H. C. Simons
Box-lid....H. E. Knaust
Breast-strap neck-yoke-ring holder...A. Snesrud
Brick-molding machine....S. T. H. Bradley
Bridge....O. Thomas
Bridge or crane, Traveling....H. P. Andresen
Bridle-bit....H. W. Beckwith
Brush, Cleaning-....R. T. Gillespie
Buckle....A. Fasig
Buckle....N. Hughes
Bundle-shocker....G. L. Leisner
Burial-case....O. S. Russell
Burial-casket rough box....P. D. Skahen
Burner....F. J. Albrecht
Butter-separator, Pneumatic....L. Lillard
Button-fastener....J. Cohn
Button-matcher....E. L. Buxbaum
Buttoner and shoe-horn, Combined shoe-....S. J. Rivoire
Cabinet-index....C. E. Flanders
Cabinet, Rural-free-delivery-carrier's....B. C. Hamer
Cable-adjuster....M. W. Beardsley
Calendar, Perpetual....W. F. Hunt
Camera, Folding....F. A. Anthony
Candelabrum and flower-holder, Combined....W. H. Pruden
Car, Box-....M. C. Blest
Car construction....C. A. Lindström
Car-coupling....S. Morris
Car-door....J. A. Rickabaugh
Car, Dumping-....M. H. Treadwell et al
Car, Dumping-....S. A. Larsson
Car end brace, Railway-....R. V. Sage
Car running-gear, Railway-....A. R. Angus
Car-stake....J. Bagley
Car-stake....F. Shillin
Car-truck column-guide....C. F. Murray
Car truck, Railway-....G. G. Floyd
Car truck, Railway-....J. M. Hansen
Car-truck side frame....E. H. Benners
Carburcting plant, Safety....C. M. Kemp
Carrier system....H. A. Jackson
Cash-register....T. Carroll
Casting-furnace, Ingot-....P. Schmidt et al
Cereal cake or body....H. A. Lauhoff
Chair....D. Schustek
Chair, Child's....I. Unger. (Reissue.)
Check-mold....C. E. Herd
Chute, Hog-....W. P. Allen
Cigar-cutter....G. A. Arnold
Cigars, Manufacturing....C. M. Berry
Cigarette-case....B. Epstein
Circuit-closing device....A. A. White
Circuit-controller, Thermostatic...G. H. Bowen
Clamp....G. L. Hoffer
Closet-seat....A. J. Martin et al
Clothes-drier....J. Lowendahl
Clothes line and pin....C. Patterson
Clothes-washer....S. T. Black
Clutch....E. E. Norton
Cock for gas-fixtures, Automatic cut-off....R. E. Staples
Coffee and tea infuser....R. Troemel
Coffee-machine....S. Sternau et al
Coke-oven charges, Machine for leveling....W. B. Morgan et al
Coke-pushing machine....C. Rouse et al
Collar-pad....L. O. King
Column, Distilling....R. Vallat

Column, Distilling or rectifying.....R. Vallat
Comb-cleaner.....F. Fevola
Compresser, Hydraulic..L. E. L. Themke et al
Concrete building-blocks, Divided bond for two membered.....L. B. Larsen
Concrete-mixer.....W. Wolter et al
Concrete pile and forming the same.....M. M. Upson
Concrete structures, Driven mold for sunken.....L. H. Brace
Condiment-holder.....C. E. Nixon et al
Conduit.....W. Houghton
Control system.....R. P. Jackson
Controller construction.....E. W. Stull
Controlling apparatus.....A. G. Wessling
Conveyer.....J. H. Long
Cooker and evaporator.....T. W. Wade
Cooking utensil.....R. Vaughan
Cop or yarn-package.....S. W. Wardwell
Copper-leaching process.....F. Laist
Corn-husker.....T. L. Brumback
Corset.....M. J. Lang
Corset-attachment back-protector.....G. F. Shankland
Cotton-chopper riding attachment.....N. S. Sodekson
Crane, Traveling.....L. H. Miller et al
Cultivating-scrape.....A. F. Davis
Cultivator.....A. J. Compton
Current regulator, Electric-..D. R. Knapp et al
Curtain-bracket.....A. W. Appleton
Cutting apparatus.....S. Davis
Cycle engine, Double two-.....W. L. Morrow
Cycle, Single-wheel, (Monocycle.).....O. Schuhmann
Cycles, Means for locking the steering-heads of.....H. Jansen
Dental gold inlays, Appliance for casting.....V. Macdonald
Dental lip-protector.....E. C. Wackler
Derrick-hoist.....B. G. Cope
Disk shaping and sharpening machine.....O. T. Fegert
Display apparatus.....J. Jr., and A. A. Wiedemeier
Display-package.....C. J. Miller
Display-rack.....J. J. Karges
Ditching and grading machine.....M. G. Bunnell. (Reissue.)
Dividing-board.....R. Loving
Dock, Floating, 2 pats.....A. Mehlhorn et al
Dog-bench.....T. B. Middlebrooke
Doll-eyes mechanism.....A. C. Hover
Door-frame and vestibule member, Combined reinforced.....S. W. Fish
Door-stop.....C. Schneider
Door stop and check, Combination.....T. R. Thorsen
Dough-mixing machine.....L. C. Sharpless
Draft-equalizer.....J. Siemsen
Draft-equalizer.....H. Watson
Drafting-tool.....C. H. Robins
Dredger-cutter.....A. Lkievicz
Drying and treating lumber..A. J. Uphus et al
Drying-machine.....J. C. Taliaferro
Dropper.....E. C. Glines
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Bowling-alley....C. B. Brenneman
Box-covering machine....F. R. Harris
Brake-beam safety-hanger....T. E. Buck
Brick, Interlocking....J. Soss
Brush, Fountain-....J. B. Fesler
Brush, Pigtail-....L. C. Hawley
Buckle....C. S. Comstock
Buggy-top support....E. G. Martin et al
Building brick or hlock....J. Soss
Bullet-mold....A. J. Mundt
Burglar-alarm....E. L. Rycraft
Butter-cutter....J. N. Jacobsen
Butter-mold....J. N. Jacobsen
Butter mold and cutter....A. P. Griffen
Butterin, Manufacturing..H. H. and E. Schou
Button-hlanks from shells, Machine for cutting....A. P. Wallace
Button, Collar-....L. Heynemann
Camera, Vest-pocket....M. Niéll
Candelahrum....M. V. Anderson
Cap....J. N. Weikly
Car....A. Becker
Car chock, Railway-....S. Otis
Car door-operating mechanism, Dump-....J. O. Neikirk
Car, Dump-....J. O. Neikirk
Car, Dumping-....M. H. Treadwell et al
Car-fender....T. F. Gallagher
Car-fender, Automatic....J. A. Byers
Car, Plow-....J. O. Neikirk
Car, Railway-....J. Giczewski
Car-vestibule diaphragm....H. H. Schroyer
Car-wheel....F. K. Vial
Car-wheel hroken-flange detector....W. R. Coglan
Carnation-holder....E. G. and H. Klahn
Carrier....A. K. Lee
Carrier system, Pneumatie-....W. H. Earl
Cash-register, 2 pats....T. Carroll
Caster, Ball-....J. H. Fenney
Catcrer's cup....G. O. Crawford
Cattle-guard....G. W. Cline
Cement-packer....E. P. Kleppinger
Chair-arm-hrace cutter....W. Kraedemann
Chamher-pot....S. D. Allen
Chamfer-gage....A. E. Naldrett
Change-delivering means....E. B. Gallaher
Chemical action in gases, Effecting....D. R. Lovejoy
Christmas trees, &c., Stand for....E. E. Rice
Cigarette-manufacturing machine....D. Weil
Circuit-controller, Drawbridge...F. A. Wender
Circuits of electrostatic reaction-currents, Method of and apparatus for relieving wire....N. G. Warth
Claw-coupling, Central-buffer....L. Scheih, Sr., et al
Clock, Alarm-....G. Kern
Clock, Electric....R. D. Hickok
Clock, Electric secondary....H. B. McCabe
Clock or watch indicator....A. E. Aeschlimann
Closet-seat....S. L. Easthurn et al
Clothes-drier....L. Duncan
Clothes-peg....C. Ehlers
Clothes-washer....G. B. Wilson
Clutch....C. T. Painter
Clutch....H. H. Taylor
Clutch and operating means therefor....A. E. Holcomb
Clutch, Electromagnetic....H. Ast
Clutch for windlasses and hoisting-machines, Automatic safety-....J. B. Pruden
Cock, Adjustahle regulating-....W. N. Best
Coffee-urn....J. P. Blocker
Coin-holder, Pocket....G. B. Birch et al
Coins and the like, Counter for....A. U. Westfelt
Collar-tipper....W. Bartholomew
Combination-lock....W. H. Taylor
Combustion-engine....O. G. Simmons
Commutator neck or lead....A. P. Peck
Compressor, Thermo-....C. Prache
Computing-machine....A. F. Johnson
Concrete-construetion form....C. M. Markham
Concrete construction, Reinforced....C. R. Steiner
Conerete-form holder and adjuster....J. G. Hosmer
Concrete-mold....W. B. Weldon
Concrete-slab-making machine....O. D. Tegarden
Concrete-structure reinforcing device, 2 pats....J. T. Simpson
Connector....M. O. Spring
Contact device....F. B. Klopf
Cooking utensil....H. S. Van Patten
Cooling rooms, Apparatus for....P. Grayson
Cork, Composition....J. A. Jones
Corn, Method and apparatus for popping....H. G. Eckstein
Corn-planter and marker....W. H. Duean
Cot, Folding....P. J. Oherg
Cotton-chopper....F. Trawick
Cotton-chopper....C. E. Hedgepeth
Cotton chopper and cultivator, Combined....J. F. Agee
Cotton or other fibers, Machine for opening and eleaning....R. and J. Greenhalgh
Cotton scraper and cultivator, Comhined....G. W. Randolph
Couch....H. C. Henderson
Couch, cot, and davenport, Comhined....J. L. Tandy
Crih, Corn-....Z. E. Williamson
Crockery-handle, Detachable....H. E. Bowles
Crossing, Movable-point....W. M. Henderson
Crutch....H. A. Hood
Cultivator....G. A. Plank
Cultivator trip mechanism....C. J. Kalkhurst
Cup-handle....C. Thessen
Curtain frame, Sash-....D. M. Sarkisian
Cut-off, Safety....R. H. Cowdrey
Cutting hones and other materials, Machine for....R. H. O'Neill
Cylinder, Governor-....C. R. Cude
Dampening and stretching machine....L. H. Carleton
Deposit-box, Automatic....H. G. Dorsey
Derrick-swinging mechanism...O. J. Martinson
Detonator-casings, Charge for....L. Wöhler
Developing apparatus....G. C. Beidler
Dial....L. B. Ferguson
Die-finishing machine....G. H. Wehb
Dish-receiver....R. R. Parry
Disinfection....A. Gärtner
Display and card rack....M. J. Orin
Display-box for fruits and vegetahles....F. E. Cabanis
Display-case and binder, Portable....A. M. Knauber
Distilling apparatus, Wood-....G. Walker
Diving apparatus....J. L. Watson
Door and window fastener....R. R. Bulger
Door-hanger....E. G. Worden
Door-lock....D. Hileman
Draft attachment....D. W. Davis
Drawing-rolls, Top-roll clearer for..J. F. Reed
Drilling apparatus, Core-....C. A. Terry
Drilling-machine chuck, Rock-....L. C. Bayles
Dyeing apparatus....R. Diederichs
Dyeing-machines, Hoisting and agitating apparatus for....J. Hussong
Dyes, Making hlack sulfur....A. F. Poirrier
Dynamometer, Transmission-....B. Hopkinson et al
Egg-tester....E. C. Waldorf
Electric-lighting device....C. Wheeler
Electric machine, Dynamo-....B. A. Behrend
Electric telegraphy....I. Kitsee
Electric waves, Oscillation-detecting means for receiving intelligence communicated by....G. W. Pickard
Electrical insulation, System of...F. M. Locke
Electricity-removing means, Static-....W. H. Chapman
Elevator safety appliance....E. Hardesty
Engine electric igniter, Explosive-....G. A. Goodson
Engine fuel-heater, Explosive-....H. Hertzherg et al
Enginc stuffing-box, Gas-....A. Wefing
Engine valve mechanism, Gasolene-....C. J. Gustafson
Engine vaporizing device, Internal-combustion-....J. S. de Roos
Envelop....W. C. Jones
Envelop, Novelty surprise-....A. V. Donahey
Exerciser, Physical....J. Lievre
Exhaust-head....G. C. Rittenhouse
Expansion-wheel....R. R. Stein
Explosion petroleum-engine....E. Körting et al
Eyeglasses....G. J. Lowres
Fabrie-slitting machine....J. A. Cameron
Fahrics and other material, Producing glossy or silky effects on....L. Lilienfeld
Fastener....J. E. Wallis
Faucet....W. H. Kilhourn
Faucet....G. R. Hohman
Feeding-machine attachment....J. Kleidmann
Fence and hitching post....W. H. Kessler
Fence-post, Iron....B. P. Andersen
Fertilizer-distributer....L. G. Herrick
Fibrous material, Mordanting...F. Blumenthal
Filaments for lighting and heating, Making....G. Michaud et al
Filter....J. P. White
Finishing and lustering machine....X. Bossart
Fire-extinguisher....J. Richard
Fire-kindler, Automatic....S. F. Bates
Firearm....R. T. Torkelson
Fireplace-frame wiring device....W. G. Taylor
Fishing-reel....V. R. Roberts
Flash-light device....A. Robbins
Floor-scraper....J. F. Bradbury
Flue-cleaner, Boiler-....R. W. Hamann
Flue-cutter....C. J. Zillgitt et al
Flue-scraper....A. B. Heimann
Fluid-drawer....T. G. Strater
Fluid-pressure system....W. F. Schneider
Fluid-recorder....E. S. Cole
Fly-escape....A. W. Salokar
Folding-machine....G. J. Dormandy
Food product....L. Coltrin
Forging apparatus, Axle-....J. H. Baker
Fruits, vegetables, &c., Receptacle for holding....A. J. Thrower
Fur for felting, Machine for carroting or otherwise preparing....J. Langley
Furnace arch, Locomotive-....C. B. Moore
Furnaces, Regulation of polyphase....R. Fleming
Garment-fastener....D. J. Wickers
Gas-burner....F. E. Buddington
Gas, Manufacture of....J. Bueb
Gas-mixer....L. M. Simmons
Gas mixturcs, Blowpipe for burning....G. E. Roberts et al
Gas-valve, Pressure....F. O. H. Fincke
Gases, Apparatus for chemically combining, 2 pats....D. R. Lovejoy
Gases, Apparatus for effecting chemical action in....D. R. Lovejoy
Gases, Effecting chemical action in....D. R. Lovejoy
Gases, Filling mass for receivers for storing explosive....G. Dalén
Gearing, Transmission-....W. K. Blackburn
Generator....I. Harleman
Glass-gathering machine....R. D. Brown
Glass, Making plate or sheet....T. Spillane
Grain-drill, 2 pats....D. A. Schutt
Grain-drill....E. H. Collins
Grain-elevator....J. C. Tobias
Graphophone attachment...W. S. Rodenherger
Graphophones and records therefor, Cabinet for....W. C. Hills
Grip, Tramway-bucket....C. A. Case
Guncotton charges, Manufacture of eompressed-....J. A. Carter
Gun-eleaner....E. F. Fletcher
Hair-roll....R. H. Damon
Halter....W. S. Farrar
Hame....C. E. Cameron
Hammer, Power-....J. O'Brien
Harvesting machine, Potato-....C. Keibel
Hat-holder....G. Auhuchon
Hatch-fastening device....O. P. Peckham
Heat-interchanging apparatus....A. F. Cramer et al
Heating and ventilating appliance....J. L. Waterbury
Heating apparatus, Water-....G. W. Mason
Heating apparatus, Water-....J. B. Beauvais
Heating plant for buildings, Hot-water-....C. Obrehowiez
Heating system....A. J. Van Doren
Hem or seam for sewed artieles....J. G. Lewis
Hides or skins, Machine for treating....D. P. O'Brien
Hoist, Hay-rack....I. Lester
Hook-eye....A. C. Carl
Hooks and eyes to cards, Machine for attaching....W. M. Corthell
Hoop lock-cutting machine, Barrel-....E. and B. Holmes et al
Hoop-roller....S. G. Petterson
Horse-calk, Emergency....C. Berg
Horse-collar, Pneumatic..A. J. and C. M. Fike
Horse-detacher....J. Zimmer
Horse-trappings....C. L. Warner
Horseshoe....H. J. Filliez
Hose-coupling....T. Withrow
Hose-reel....L. Vader
Hose-supporter....H. Allen
Hot-air furnace....J. H. Sangree
Immersion-regulator for submarines and torpedoes, Automatic....E. Schneider
Incandescent hurner....H. M. Reichenhach
Index and pad, Combined....C. H. Young
Index tray, Card-....F. W. Gerhard
Insulating-bushing....L. Steinberger
Insulator....W. H. Kempton
Insulator, Disk strain-....L. Steinberger
Insulator, Heat-....H. Mock
Intermittently-driven mechanism adapted for constant driving....H. H. Taylor
Internal-comhustion engine....D. Roherts
Iron or steel sheets, Manufacture of plated or coated....J. W. Paton
Journal-hearing, Car....D. M. Watson
Journal-box....T. H. Symington
Junction-box....J. N. Scism
Knife sections, Means for joining sectional-....G. J. Mayer
Knitting-machine....W. D. and L. C. Huse
Knitting machines, Automatic measuring attachment for circular-....J. B. Hipwell
Lacing device....R. J. Evans
Lacing-hook....F. A. Herrick
Lag-indicator....W. H. Freedman
Lamp, Arc-....C. C. Hughes
Lamp, Arc-....E. O. Dworak
Lamp, Incandescent, 2 pats....J. W. Howell
Lamp-socket attachment, Incandescent-....H. H. Ham
Lamp, Vapor-....A. A. Warner
Lamps, Manufacture of metal-filament....W. C. Arsem
Leather-rounding machine....R. A. Pfeifer
Leather-working machine....W. H. Stimpson et al
Level, Plumb-....T. N. Roach
Lid-lifter....J. J. Meehan
Liquid filling-tube....A. Schneider
Liquids, Electrolysis of....J. Billiter
Lock....W. J. Carroll
Lock....W. J. Teese
Lock-strike, Adjustable....D. W. Tower
Locking-bolt....G. H. Wheary
Locomotive engines and tenders, Draft-gear for....H. M. Pflager
Locomotive-furnaces, Front arch for narrow-....C. B. Moore
Locomotive-tender....E. Ryan et al
Loom, Automatic weft-replenishing....H. Wyman
Loom, Automatic weft-replenishing mechanism....W. R. Stitt
Loom, Narrow-ware....O. W. Schaum
Loom pattern mechanism....O. L. Owen
Loom starting and stopping mechanism....A. E. Rhoades
Looms, Shuttle-positioner for weft-replenishing....W. R. Stitt
Lubricator....H. A. Sedgwick
Lubricator....H. C. Woodhridge
Luhricator....E. J. McGuire
Lunch-case....L. M. Justice
Magnetic separator....M. Ruthenhurg
Mail-hag catching and delivering mechanism....L. B. Futer
Mail-hox....C. W. Palmer
Mail-transferring apparatus....R. H. Page
Mandrel....W. Evans
Manure-loader....J. B. Schuman
Marine propulsion, 3 pats....W. P. Thompson
Match-packing machine....E. J. Young et al
Measuring machine, Cloth-....R. G. Nicholas
Meat-hook....E. Miller
Metal culvert, 2 pats....B. W. Harris
Metal strips into washers, Machine for hending flat....A. W. Herbert
Metals from their ores, Obtaining....K. Kaiser
Miea, Treating....J. P. W. Beekman
Micrometer-indicator, Liquid....F. G. Purinton
Mine-door....J. L. Dinwiddie et al
Mining....M. Schwerin
Miter-box....S. W. Shue
Mixing-chamber....L. Rosenbaum
Motor-oiling system....K. G. Johnston
Music-sheet-perforating device....T. M. Farley
Musical instrument....I. F. Gilmore
Musical instrument, Enharmonie....J. Hefferman
Napkin, Sanitary....O. C. Schulz
Nest for hens, Trap-....M. J. Whitty
Nozzle, Spray-....E. C. Brown
Nut-loek....C. H. Price
Oil-burner....J. Harleman

Oil-cup....W. McLain
Oil-tank automatic cut-off....H. C. Weitzel
Ores, mattes, and metals for armor-plate, rails, &c., Smelting....W. E. Everette
Outlet-box....E. L. Pierce
Oven....I. A. Boeddener
Oven, Coking-....E. Ledoux
Oven-heat retainer....C. Crossan
Oyster-opener....A. G. Molnar, Jr.
Package-tier....J. C. Pickens
Padlock, Permutation-....H. F. Creim et al
Paint and varnish remover....C. Ellis
Paper bag....H. G. Widmer
Paper-cutting machine....G. Fomm
Paper package....O. L. Parmenter
Pavement or vault construction....H. C. Seipp
Pencil....J. D. R. Lamson
Penholder....W. L. Gordon
Perch, Chicken-....W. H. Cole
Permutation-lock....E. J. Bossert
Photographer's form and print holder....M. B. Harlow
Piano-action....A. B. Cross
Piano-player, Automatic....S. A. Swanson
Piano repetition-action....L. Charpiat
Picture and looking-glass frame....F. J. and H. G. Carl
Picture machine, Moving-....C. A. Moran
Piling....J. J. Walther
Pillow, Pine-needle....R. F. Warham
Pin holder, Scarf-....H. Hartmann
Pin safety-lock....W. A. Olsen
Pipe-stem, Sanitary....J. J. Gottschalk et al
Pipe trap, Waste-....O. Waibel
Pipe-wrench....G. E. Woodbury
Pipe-wrench, Chain....G. Amborn
Piston....G. H. Reynolds
Placket-closer....R. S. Valentine
Planer and scraper, Floor....G. J. Kepplinger
Plow....C. B. Henderson
Plow....R. C. Bryan
Plow running-gear....L. L. Awtrey
Plows, corn-planters, and the like, Marker-gage for....J. B. Roberts
Plugger, Hand-operated....C. H. Hart
Plumb and level, Combined....S. F. Hambleton
Plumbing and pipe testing device....G. W. Heiland
Portière-rod....A. J. Robinson
Post construction, Newel-....J. Gelin
Post mold, Fence-....J. B. Storms
Potato-digger....A. L. Hoover
Powder-divider, Proportional....W. Votteler
Powder, Smokeless....A. T. Cocking
Power from car-axles, Mechanism for transmitting....H. H. Taylor
Printing-machine inking apparatus....R. M. Davidson
Printing-press impression-latch....F. E. Meehan
Prism-telescope and similar prism-carrying device and means for adjusting the prisms....H. Jacob
Processing apparatus....A. E. Bimmerle
Projectile....E. Gathmann
Projectile time-fuse....H. Maxim
Pulley, Self-oiling loose....H. A. Davis
Pulp articles, Apparatus for making....M. L. Keyes
Pulp articles, Joint for machines for molding....M. L. Keyes
Pump....H. C. Lyons et al
Pump....J. E. Sharpe
Pump, Oil-....R. Huff
Pump, Steam-driven....G. Rennerfelt
Pump-valve....J. E. Hill
Pumps, &c., Mechanism for operating....T. A. Davis
Radiator-indicator....H. Vissering
Rail....U. G. Potts
Rail-joint....A. J. Holmquist
Rail-joint....A. W. Samberson
Rail support....T. N. Jacob
Railway-car air-brake system....D. A. Dean
Railway block-signaling system....H. M. Coulter
Railway-crossing....P. O. Adams
Railway-gate, Automatic....E. C. Smith
Railway-rail....W. R. Wilson
Railway road-bed....M. Franklin
Railway-spike....F. W. Kohagen
Railway switch-frog....H. F. Roach
Railway-tie....J. Grimmer
Railway-tie....W. Hubbell et al
Range-finder....L. Taylor
Razor-honing machine....C. F. Boldt
Razor, Safety-....L. H. Cobb
Recording and calculating machine, Combined....L. G. Julihn
Reduction-furnace....C. Van Brunt
Reel and drum....S. C. Sampson
Refuse-destructors and other furnaces, Means for charging....H. N. Leask
Registering mechanism....E. M. Phillippe
Rein-holder....H. Ogan
Road-grader....L. E. Wild
Rock-drill....J. R. Wilson et al
Rock-drill....J. H. Huhn
Rod coupling, Drill-....W. Minard
Rod-straightening mechanism....R. Milne
Rotary engine....P. A. Johnson
Rubber, Manufacture of artificial pará....J. Blum
Sad-iron cover....R. C. Keron
Sash fastener or lock....F. Mis
Sash fastener, Window-....R. Henry
Sash fastener, Window-....H. Osborne
Sash-holder....E. T. Gaskill
Saw blade, Circular-....G. N. Williams, Jr., et al
Scale....B. D. Emanuel
Scale, Pitless....W. F. Stimpson
Scraper, Mud-....I. P. Whitaker
Screw protector, Set-....P. M. Legere
Seaming-machine....S. Opsal
Sectional chair....F. W. Anderson
Self-opening bag....H. G. Widmer
Self-opening paper bag....H. G. Widmer
Sewage-distributer....J. W. Hartley
Shade bracket, Window-....F. Hannemann
Shade, Window-....E. T. Bell
Shaft-coupling....C. A. J. Lindstrom
Shaft-key-extracting device....J. Clausen
Sheet-piling, Interlocking....E. E. Slick
Shell-reducing device....H. W. Menge
Shells for rain-water cut-offs, Manufacturing of....T. F. Crary
Ship or log speed-indicator....H. G. A. Klapproth
Shoe-polish....H. T. Widgren
Shoe-shank-tacking machine....B. B. Waterman
Sifter, Ash-....H. Schnitzler
Signaling device for humidors....C. Subert
Signaling system, Electrical....J. P. Sauer
Skate, Roller-....E. P. Rother
Slaughter-house killing-pen....A. R. Shaw
Sleeping-garment, Combination....A. G. Velasko
Sleigh, Cycle-....C. C. McCoy
Small-arm, Recoil-loading....P. Mauser
Smoke cleaning or washing apparatus....J. Black et al
Smoke or gas cleaning or washing apparatus....J. Black et al
Smoking-pipe....G. W. Clapp
Sodium perborate containing borax and producing same....F. Fritsche
Soldering machine, Can-....J. C. Fetzer
Sound-reproducing machines, Automatic cut-off for....J. Eifel
Speed-changing mechanism....F. L. Chase
Speed-changing mecbanism, Automatic....K. V. Höhne
Speed friction transmission device, Internal variable-....H. Lutz
Spike-puller....W. E. Werd et al
Spinning or twisting frame thread-guide support....J. T. Meats
Spinning, twisting, and doubling machine....S. Z. de Ferranti
Spool, Thread-....E. A. Zobel
Spraying device....J. W. Stewart
Spring....A. N. Lukens
Spring, King-bolt....T. Karle
Spring, Pneumatic....W. C. McCullough
Sprinkler, Lawn-....J. D. Humphrey et al
Sprinkling device....K. S. T. Björkman
Stalk-cutter....H. Hestand et al
Stamp-vending machine, Coin-operated....W. V. R. Seltzer
Stamping, dating, or numbering machine....I. Eyer
Steam-generating apparatus....W. L. Rose
Steering-gear....H. C. Clay
Stencil apparatus....E. H. Koenig
Stool....I. G. Whitlow
Stop-motion, Filling....G. Naylor
Stove....W. B. Engle
Stove, Gas-....J. H. Bennett
Stovepipe attachment....S. A. Tipton
Sunshade-gear for personal wear....W. L. Ridout
Suspenders, Man's....S. Brown
Suspending frame, Collapsible....H. Levin
Switch-box....E. J. Dustman
Switch-frog....H. F. Roach
Switch mechanism....W. C. Lawson
Switch-operating mechanism....R. Brown
Switch-operator....J. Anderson
Switchboards, &c., Protective apparatus for....W. Kaisling
Table gage, Saw-....M. E. Loehr
Talking-machine diaphragm....W. W. Young
Tank-heater....J. S. Jacobsen
Tanks, &c., Apparatus for discharging the contents of septic or settling....S. F. Miller
Tannin extracts, Decolorizing....A. Hugendubel
Telegraph-relay....J. Scotland
Telegraph-transmitter and type-writing machine, Combined....A. G. Snyder
Telephone-exchange and alarm system, Combined....J. M. Latimer
Telephone-exchange system and apparatus....D. B. Wick, Jr.
Telephone-indicator, Automatic....R. Sedgwick
Temperature-regulators, Thermosensitive device for automatic....W. M. Fulton
Terpenes and wood-pulp, Treating wood to produce....W. J. Hough
Threshing-machine....S. Clennin
Ticket or stamp delivering receptacle....V. Hegarty
Time-register, Watchman's....G. W. Ellis
Tire, Pneumatic....C. Scheuner
Tire, Pneumatic....J. L. Coesir
Tires of wheels, Protector and non-skidding band for pneumatic....A. T. Hughes
Toaster....J. I. Frith
Tobacco-press....E. Johnson
Tool and punch, Belt....G. G. Jones
Tool-handle, Detachable....H. F. Pocan
Tool, Precision-....C. P. O'Neill
Tongue-support....D. Lippy
Toothpick-boxing machine....G. P. Stanley et al
Tote-box....W. E. Donnelly
Toy....A. J. Nusly, Jr.
Toy, Illusion....J. S. Fax
Toy or amusement device....P. M. Welsh
Track or rail, Tramway and railway....J. H. Briggs
Train-stop, Emergency....P. Conniff et al
Train-stopping device, Emergency....P. Conniff et al
Tramway system....W. Bradford
Trap-fitting, Combination....H. L. Parker et al
Traveling carrier, Overhead....G. H. Downs
Treating materials by the action of air or other gases....J. E. Greenawalt
Trolley-harp....J. Pensis
Trolley head and harp....C. E. Marks
Trolley-pole attachment....C. Ruggaber
Truck....F. C. Scherping
Tube-scraper....J. Georges et al
Tubes, Manufacture of compound....G. H. Everson
Tubes, Reworking....W. H. Richards
Turn-table....J. F. Lawry
Turning and boring machine, Porch-column....J. Buffelen
Twine-holder....H. E. Brown
Type casting and distributing machine....J. S. Thompson
Type-writer key-lever fulcrum....C. C. Harting
Type-writer ribbon feed....L. P. Diss
Type-writer shift-frames, Auxiliary support for....T. L. Knapp
Type-writing machine....H. S. McCormack
Type-writing machine....H. L. Wagner
Type-writing machine....W. C. Farnum
Type-writing machine....G. A. Seib
Type-writing machine....F. A. Young
Type-writing machine....W. J. Barron
Type-writing machine....W. E. Burnett
Type-writing machine....T. L. Knapp
Type writing machine....G. A. Seib
Type-writing machine....W. F. Helmond
Umbrella top-notch....W. C. Moulton
Undergarment, Union....J. C. Scott
Undergarment, Union....L. H. Wise
Underreamer....C. T. Mapes
Uniting a flexible to a solid body....C. D. McCourt
Valve....A. S. Lindkuvest
Valve and piston, Semi-plug piston-....J. P. Wilson
Valve for hydraulic elevators....A. R. Klingloff
Valve, Gate-....H. C. Farrell
Valve, Piston inlet-....H. C. Sergeant
Valve-plug....J. H. Chandler
Valve, Radiator-....A. S. Trask
Valves or electric switches at predetermined times, Means for automatically operating gas or other....A. Hare
Vegetable-grating device....S. R. Kelley
Vehicle-brake lever and ratchet....M. Potter
Vehicle cases, Drain-cock for motor....R. Huff
Vehicle-indicator....L. M. Tingley
Vehicle, Motor-....A. Przygode
Vehicle, Self-propelled....J. Vollmer
Vehicle steering-knuckle....J. C. Bashford
Vehicle steering mechanism, Motor-....A. Paré
Vehicle steering mechanism, Motor-....G. G. Porter
Vehicle-wheel....T. A. Silverwood
Vehicle-wheel hub....J. F. Bastel et al
Vehicle wheel, Motor-....A. L. McMurtry
Vending machine, Coin-controlled ticket-....W. E. Stratton
Ventilating system....C. J. Wilson
Ventilator....J. Fink
Venting attachment, Safety....J. Cohn
Violin chin and shoulder rest....B. Henrikson et al
Vise, Pipe-....C. W. Sievert
Wagon-brake....R. C. Pryor
Wagon-brake mechanism....E. G. Doland
Wagon, Child's velocipede-....A. Hamill
Washboard....L. E. Benson
Washboard....S. F. O'Connor
Washboiler attachment....W. F. Fessler
Washer....F. A. Lange
Waste, Mechanical....G. H. Burleigh
Water-closet-flushing apparatus....C. Hammer
Water-closet tanks, Siphon for....M. F. Richardson
Water-cooler....H. G. Cordley
Water-heater, 2 pats....H. S. Humphrey
Water-heater....P. Sasso et al
Water in steam-boilers, Device for purifying....W. P. Wiemann
Water-level in baths, Apparatus for indicating the....P. S. von Gwiazdowski
Water, Softening....A. Brandes
Weighing apparatus, Automatic....P. Edtbauer
Well-drilling machine....D. W. Saunders
Well-packer....C. C. Heeter
Wheat-wetting device....K. Dougan
Wheel attachment....L. L. Curtis
Wheel drive, Traction-....J. B. Dumais
Wheel hood, Propeller-....G. B. Davis
Winding-indicator....S. Kahan
Windmill, Vaneless....C. A. Whiting
Window-ventilator....C. V. Szczygiel
Window-ventilator....T. H. Garland
Wire feed and measuring-wheel, Warp-....F. L. Kelley
Wire fencing....E. F. Shellaberger
Wire, Manufacture of barb-....E. F. Shellaberger
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Wire-splicing machine....R. W. Wise et al
Wire-stretcher....E. F. Schuster
Wood, Changing the grain of....M. A. Possons
Work-rack....R. S. Brown
Wrench....A. Schubert
Wrench....J. W. Sheppard
Wrench....A. C. Smith
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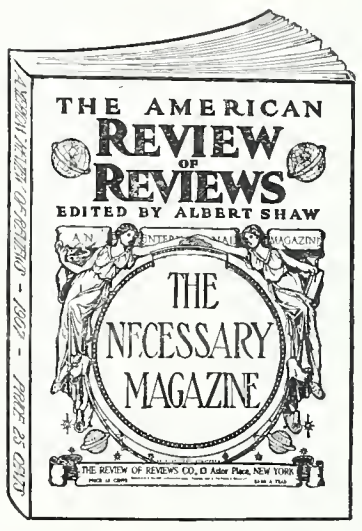
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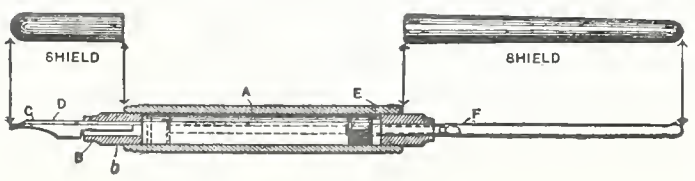
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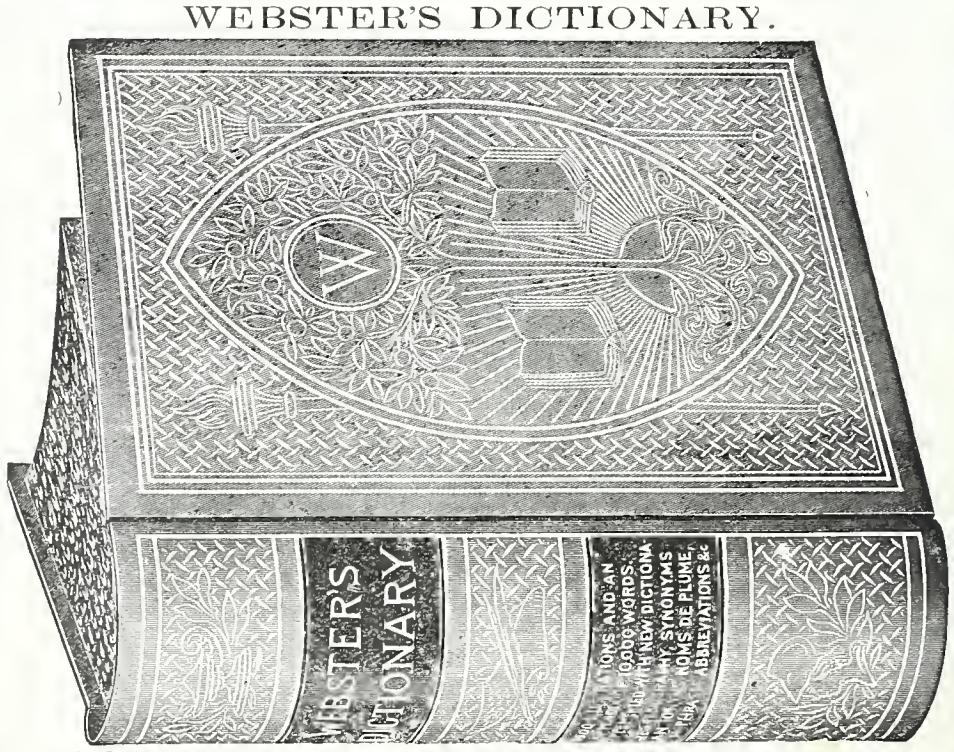


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